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AF MANUAL 171-714  
Volume I  
7 March 1978

## Automatic Data Processing Systems and Procedures

### SELECTIVE INQUIRY SYSTEM (SIS): P037/QI

#### COMPUTER OPERATION MANUAL

This manual establishes procedures for utilization of the Selective Inquiry System (SIS) and the Timesharing Retrieval Subsystem (TRS) on the H6000 computer. It applies to all functional user personnel who have a requirement for batch and online retrievals of data from data bases residing on the H6000 computer. The information in this volume is used in conjunction with the user information found in AFM 171-714, Volume II.

NOTE: This manual has been written to be easily understood by its primary audience. However, there are certain words that are commonly used in performing the functions described here. These are listed in paragraph 1.3, titled "Terms and Abbreviations." We advise you to review them before reading this document.

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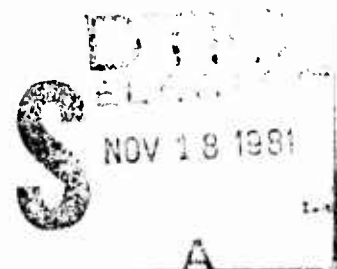
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## PART ONE - SELECTIVE INQUIRY SYSTEM

## SECTION 1. GENERAL

1.1 Purpose of the Computer Operation Manual. The objective of this Computer Operation Manual for the Selective Inquiry System (SIS), DSD P037, is to provide computer control and computer operator personnel with a detailed operational description of the system and the procedures for loading it.

1.2 Project References:

- a. AFM 171-714, Volume II, Selective Inquiry System (SIS): P037/QI, 7 March 1978.
- b. AFM 171-604, Volumes I and II, Parts 1 and 2, H6000 Utility Software: P891/ZA, 1 December 1976.
- c. Honeywell Control Cards Reference Manual, DD31.
- d. Honeywell General Loader, DD10.
- e. Honeywell Source and Object Library Editor, BJ71.
- f. Honeywell General Comprehensive Operating Supervisor, BR43.

1.3 Terms and Abbreviations.

- a. Dash (-) denotes locally determined.
- b. Time Sharing System (TSS) consists of an executive program, a number of independent processing subsystems which execute under the executive, and a common command language.

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## SECTION 2. SYSTEM OVERVIEW

2.1 System Application. The purpose of SIS is to provide a powerful, flexible, generalized system designed primarily for retrieval and reporting of data from single or multiple files. To provide the capability to respond to most reporting needs with a minimum of lead time and minimize the need for development of tailored programs to produce one-time reports from a data base.

2.2 System Organization. The SIS is used on an as required basis.

### 2.3 Program Inventory:

PROGRAM ID	DATA/CLASS	SECTION
QIE1FO	Reference paragraph 2.6	3
QIE2FO	Reference paragraph 2.6	3
QIE3FO	Reference paragraph 2.6	3
QIE4FO	Reference paragraph 2.6	3
QIE5FO	Reference paragraph 2.6	3
QIE6FO	Reference paragraph 2.6	3
QIE7FO	Reference paragraph 2.6	3
QIE8FO	Reference paragraph 2.6	3
QIE9FO	Reference paragraph 2.6	3

2.4 File Inventory. Figure 2-01 is an overview of input and output files that may be used in SIS. The actual usage is dependent upon local requirements.

2.5 Processing Overview. Locally determined.

2.6 Security and Privacy. The SIS system will accept data for input regardless of security classification. The SIS programs themselves are unclassified and contain no system for security protection or privacy. If any classified files or data bases are used with SIS, it is the user's responsibility to provide file protection and security for classified and/or privacy type information.

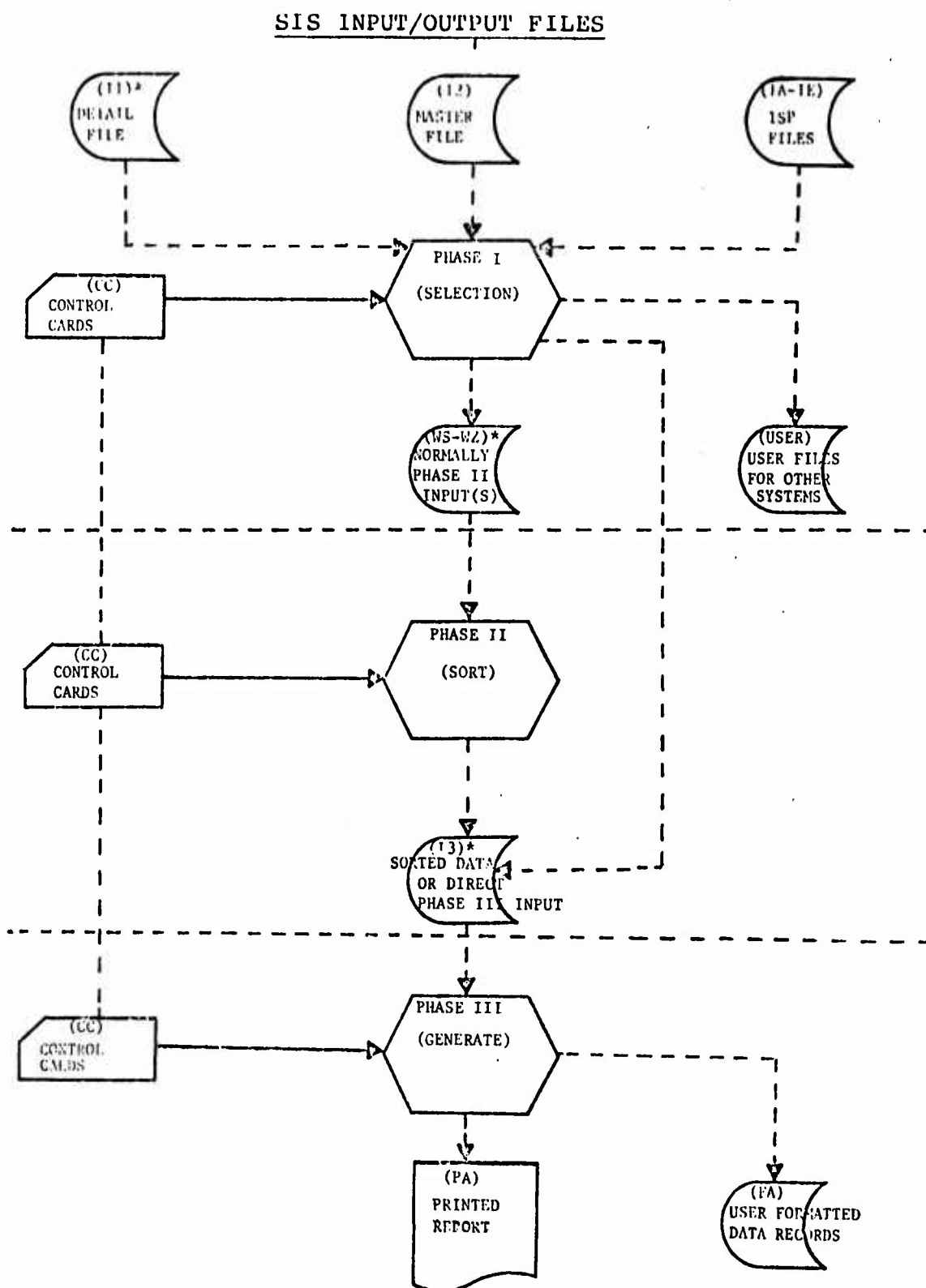


Figure 2-01. SIS Input/Output Files.

## SECTION 3. DESCRIPTION OF RUNS

3.1 Run Inventory. SIS is contained in object format on an R\* file. The nine programs must be in the sequence indicated in paragraph 2.3 to successfully load. The system is loaded on four files for speed. During execution, only the phase(s) needed are brought into core, thus saving memory requirements. The RQIE80AU00 file contains the edit program (QIE8FO) which controls execution of the appropriate next phase. The other three files contain the necessary selection, sorting, and report routines.

3.2 Phasing. NA

3.3 Run Description. The following paragraphs describe procedures for releasing the previous version of SIS and loading the new version.

3.3.1 Control Inputs. The JCL to accomplish the file releases and creation is as follows: (The file names shown contain the MAJCOM ID of the AFDSDC as an example only.)

```
$      IDENT      (user specified)
$      USERID     (user specified)
$      FILSYS
      USERID user identification
      RF user catfile/RQIE1FOBU00
      RF user catfile/RQIE3FOCU00
      RF user catfile/RQIE6FODU00
      RF user catfile/RQIE8FOAU00
      FC user catfile/RQIE1FOBU00,BLOCKS/40/,READ,MODE/RAND/
      ,FCLASS/UZZ/
C3     FC user catfile/RQIE3FOCU00,BLOCKS/25/,READ,MODE/RAND/
      ,FCLASS/UZZ/
      FC user catfile/RQIE6FODU00,BLOCKS/30/,READ,MODE/RAND/
      ,FCLASS/UZZ/
C3     FC user catfile/RQIE8FOAU00,BLOCKS/30/,READ,MODE/RAND/
      ,FCLASS/UZZ/
$      ENDJOB
```

3.3.2 Management Information. The following JCL will load the SIS system to the files created in paragraph 3.3.1.

```
$      IDENT      (user specified)
$      USERID     (user specified)
$      LOWLOAD
$      OPTION      NOSETU
$      LIBRARY     LB
$      USE          QIE1FO,QIE2FO,QIE9FO
```

```

$      ENTRY    QIE1FO
$      EXECUTE  DUMP
$      TAPE9    LB,X1S,,nnnnn,,aaaaa (See note)
$      PRMFL    RI,R/W,R,user catfile/RQIE1FOBU00
$      LIMITS   ,13K
$      LOWLOAD
$      OPTION   NOSETU
$      LIBRARY  LB
$      USE      QIE3FO,QIE4FO,QIE5FO,QIE9FO
$      ENTRY    QIE3FO
$      EXECUTE  DUMP
$      TAPE9    LB,X1S
$      PRMFL    RS,R/W,R,user catfile/RQIE3FOCU00
$      LIMITS   ,8K
$      LOWLOAD
$      OPTION   NOSETU
$      LIBRARY  LB
$      USE      QIE6FO,QIE7FO,QIE9FO
$      ENTRY    QIE6FO
$      EXECUTE  DUMP
$      TAPE9    LB,X1S
$      PRMFL    RR,R/W,R,user catfile/RQIE6FODU00
$      LIMITS   ,10K
$      LOWLOAD
$      OPTION   NOGO
$      LIBRARY  LB
$      USE      QIE8FO,QIE9FO
$      ENTRY    QIE8FO
$      LINK     A
$      EXECUTE  DUMP
$      LIMITS   ,20K
$      TAPE9    LB,X1S
$      PRMFL    H*,R/W,R,user catfile/RQIE8FOAU00
$      ENDJOB

```

NOTE: nnnnn = Reel Serial Number of R\*  
 aaaaa = File ID of R\*

### 3.3.3 Input-Output Files:

#### 3.3.3.1 Input:

RCS/PCN	TITLE	FILE ID	MEDIUM	SOURCE	DUE	DISP
See note	Control Cards	CC	-	-	-	-
See note	Detail File	I1	-	-	-	-
See note	Master File	I2	-	-	-	-
	(Optional)					
See note	ISP Files	IA-IE	-	-	-	-
	(Optional)					

RCS/PCN	TITLE	FILE ID	MEDIUM	SOURCE	DUE	DISP
See note	Sorted Data (Optional)	I3	-	DPI	-	-
See note	Selected Data (Optional)	WS-WZ	-	DPI	-	-

NOTE: SIS is not to be used to duplicate products (RCS/PCN) produced by Standard ADSs.

#### 3.3.3.2 Output:

RCS/PCN	TITLE	FILE ID	MEDIUM	DISP	DUE
See note	Selected Data (Optional)	WS-WZ	-	-	-
See note	Optional User Files	-	-	-	-
See note	Sorted Data (Optional)	I3	-	-	-
See note	User Formatted (Optional)	FA	-	-	-

NOTE: SIS is not to be used to duplicate products (RCS/PCN) produced by Standard ADSs.

3.3.4 Output Reports. The printed report produced by a SIS execution is under the control of each user.

3.3.5 Reproduced Output Reports. NA

3.3.6 Restart/Recovery Procedures. Rerun the Phase (I, II or III) from start; purge any previous output from that phase.



PART TWO - TIMESHARING RETRIEVAL SUBSYSTEM

SECTION 4. GENERAL

4.1 Purpose of the Computer Operation Manual. The objective of this Computer Operation Manual for the Timesharing Retrieval Subsystem (TRS), DPD P037, is to provide computer control and computer operator personnel with a detailed operational description of the subsystem and the procedures for loading it.

4.2 Project References:

a. AFM 171-714, Volume II, Selective Inquiry System (SIS): P037/QI, 7 March 1978.

b. AFM 171-604, Volumes I and II, Parts 1 and 2, H6000 Utility Software: P891/ZA, 1 December 1976.

c. Honeywell Control Cards Reference Manual, DD31.

d. Honeywell General Loader, DD10.

e. Honeywell Source and Object Library Editor, BJ71.

f. Honeywell General Comprehensive Operating Supervisor, BR43.

g. Honeywell TSS General Information Manual, DD22.

4.3 Terms and Abbreviations. NA

## SECTION 5. SYSTEM OVERVIEW

5.1 System Application. The purpose of TRS is to provide most of the features of SIS in an online mode for responding to quick reporting requirements.

5.2 System Organization. The TRS is used on an as required basis.

5.3 Program Inventory:

PROGRAM ID	DATA/CLASS	SECTION
QITLFO	Reference paragraph 5.6	6
QITAF0	Reference paragraph 5.6	6
QITBFO	Reference paragraph 5.6	6
QITCFO	Reference paragraph 5.6	6
QITDFO	Reference paragraph 5.6	6
QITEFO	Reference paragraph 5.6	6
QITLFO	Reference paragraph 5.6	6

5.4 File Inventory. TRS has the same input and output file capabilities as SIS. Reference Figure 2-01.

5.5 Processing Overview. Locally determined.

5.6 Security and Privacy. The TRS will accept data for input regardless of security classification. The TRS programs themselves are unclassified and contain no system for security protection or privacy. If any classified files or data bases are used with TRS, it is the user's responsibility to provide file protection and security for classified and/or privacy type information.

## SECTION 6. DESCRIPTION OF RUNS

6.1 Run Inventory. TRS is contained in object format on an R\* file. The system is loaded on six files for speed in execution. These six files must be created under the User Master Catalog (UMC) CMDLIB. This is a requirement of the Time Sharing Executive Program if user supplied subsystems are to be available to TSS users. During execution, only the program(s) needed are brought into core, thus saving memory requirements. An additional sequential file is also required for use by the RUNB command. This file consists of the \$ PROGRAM card used to execute SIS and the four PRMFL cards describing the catalog/file strings of the SIS programs at the site. This file must be in ASCII.

6.2 Phasing. NA

6.3 Run Description. The following paragraphs describe procedures for releasing the previous version of TRS and loading the new version.

6.3.1 Control Inputs. The JCL to accomplish the file releases and creations is as follows: (USERID CMDLIB must be used as shown)

```
$      IDENT      (user specified)
$      USERID    CMDLIB$password/ZZZ
$      FILSYS
      USERID    CMDLIB$password
      RF      CMDLIB/TRS
      RF      CMDLIB/TRSA
      RF      CMDLIB/TRSB
      RF      CMDLIB/TRSC
      RF      CMDLIB/TRSD
      RF      CMDLIB/TRSE
C2     FC      CMDLIB/TRS,BLOCKS/30/,MODE/RAND/,FCLASS/UZZ/,READ
C1     FC      CMDLIB/TRSA,BLOCKS/25/,MODE/RAND/,FCLASS/UZZ/,READ
C3     FC      CMDLIB/TRSB,BLOCKS/40/,MODE/RAND/,FCLASS/UZZ/,READ
      C3       FC      CMDLIB/TRSC,BLOCKS/17/,MODE/RAND/,FCLASS/UZZ/,READ
      FC      CMDLIB/TRSD,BLOCKS/35/,MODE/RAND/,FCLASS/UZZ/,READ
      FC      CMDLIB/TRSE,BLOCKS/16/,MODE/RAND/,FCLASS/UZZ/,READ
$      ENDJOB
```

6.3.2 Management Information. The following JCL will load the six TRS object files created in paragraph 6.3.1:

```

$      IDENT      (user specified)
$      USERID     CMDLIB$password
$      LOWLOAD
$      OPTION      NOSETU,NOGO,RELMEM,SAVE/TRS
$      LIBRARY     LB
$      USE          QITLFO
$      ENTRY       QITLFO
$      EXECUTE
$      TAPE9       LB,XLS,,nnnnn,,aaaaa      (See Note)
$      PRMFL       H*,R/W,R,CMDLIB/TRS
C|$      LIMITS    ,7K

$      LOWLOAD
$      OPTION      NOSETU,NOGO,RELMEM,SAVE/TRSA
$      LIBRARY     LB
$      USE          QITAFO,QITLFO
$      ENTRY       QITAFO
$      EXECUTE
$      TAPE9       LB,XLS
$      PRMFL       H*,R/W,R,CMDLIB/TRSA
$      LIMITS      ,9K

$      LOWLOAD
$      OPTION      NOSETU,NOGO,RELMEM,SAVE/TRSB
$      LIBRARY     LB
$      USE          QITBFO,QITFFO,QITGFO,QITHFO,QITIFO,QITJFO
$      USE          QITKFO,QITLFO,QITMFO,QITNFO,QITOFO,QITPFO,.TSGF.
$      ENTRY       QITBFO
$      EXECUTE
$      TAPE9       LB,XLS
$      PRMFL       H*,R/W,R,CMDLIB/TRSB
$      LIMITS      ,12K

$      LOWLOAD
$      OPTION      NOSETU,NOGO,RELMEM,SAVE/TRSC
$      LIBRARY     LB
$      USE          QITCFO,QITLFO,QITSFO,QITTFO,QITUFO
$      USE          QITVFO,QITWFO
$      ENTRY       QITCFO
$      EXECUTE
$      TAPE9       LB,XLS
$      PRMFL       H*,R/W,R,CMDLIB/TRSC
$      LIMITS      ,7K

$      LOWLOAD
$      OPTION      NOSETU,NOGO,RELMEM,SAVE/TRSD
$      LIBRARY     LB
$      USE          QITDFO,QITLFO,.TSGF.
$      ENTRY       QITDFO

```

```

$ EXECUTE
$ TAPE9 LB,X1S
$ PRMFL H*,R/W,R,CMDLIB/TRSD
$ LIMITS ,9K

$ LOWLOAD
$ OPTION NOSETU,NOGO,RELMEM,SAVE/TRSE
$ LIBRARY LB
$ USE QITEFO
$ ENTRY QITEFO
$ EXECUTE
$ TAPE9 LB,X1D
$ PRMFL H*,R/W,R,CMDLIB/TRSE
$ LIMITS ,6K
$ ENDJOB

```

NOTE: nnnnn = Reel Serial Number of R\*  
 aaaaa = File ID of R\*

6.3.2.1 Batch Execution Control File. The RUNB command requires a file named TRSF to be present on CMDLIB. This file contains the \$ PROGRAM card and the four \$ PRMFL cards used to execute SIS at the site. The file must be created in ASCII. A \$ SELECTA CMDLIB/TRSF,R is generated when RUNB is used in TRS.

```

$ IDENT (user specified)
$ USERID CMDLIB$password/ZZZ
$ FILSYS
  USERID CMDLIB$password
  FC CMDLIB/TRSF,BLOCKS/1/,FCLASS/UZZ/,READ
C2 $ PROGRAM TSCONV CMDLIB
$ PRMFL OT,R/W,S,CMDLIB/TRSF
$ DATA I*,COPY
INPUT,ASIS
$ PROGRAM RLHS,ON1,DUMP (See note)
$ PRMFL H*,R,R,catalog/filename (EDIT)
$ PRMFL RI,R,R,catalog/filename (SELECT)
$ PRMFL RS,R,R,catalog/filename (SORT)
$ PRMFL RR,R,R,catalog/filename (REPORT)
$ ENDCOPY
$ ENDJOB

```

NOTE: The \$ PROGRAM card may be user defined to conform to local retrieval control procedures.

### 6.3.3 Input-Output Files:

6.3.3.1 Input:

RCS/PCN	TITLE	FILE ID	MEDIUM	SOURCE	DUE	DISP
See note	Detail File	I1	-	-	-	-
See note	Master File (Optional)	I2	-	-	-	-
See note	ISP Files (Optional)	IA-IE	-	-	-	-
See note	Sorted Data (Optional)	I3	-	DPI	-	-
See note	Selected Data (Optional)	WS-WZ	-	DPI	-	-

NOTE: TRS is not to be used to duplicate products (RCS/PCN) produced by Standard ADSSs.

6.3.3.2 Output:

RCS/PCN	TITLE	FILE ID	MEDIUM	DISP	DUE
See note	Selected Data (Optional)	WS-WZ	-	-	-
See note	Optional User Files	-	-	-	-
See note	Sorted Data (Optional)	I3	-	-	-

NOTE: TRS is not to be used to duplicate products (RCS/PCN) produced by Standard ADSSs.

6.3.4 Output Reports. The printed report produced by a TRS execution is under the control of each user.

6.3.5 Reproduced Output Reports. NA

6.3.6 Restart/Recovery Procedures. Rerun the retrieval after using the TSS REMOVE subsystem to clear the Available File Table. Reference AFM 171-714, Volume II, paragraph 4.5 for explanations of TRS error messages.



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SUMMARY OF REVISED, DELETED, OR ADDED MATERIAL

The batch execution control file on CMDLIB/TRSF must now contain the \$ PROGRAM card which executes the batch SIS programs. This procedure is necessary to support those commands which have implemented retrieval control procedures and do not execute "RLHS" to invoke SIS.

AU GAFS, AL. (781719)800

REPRINT 3 October 1980  
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Headquarters US Air Force  
Washington DC 20330

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7 March 1978

Automatic Data Processing Systems and Procedures

SELECTIVE INQUIRY SYSTEM (SIS): S037/QI C5

USERS MANUAL

This manual establishes procedures for utilization of the Selective Inquiry System (SIS) and the Timesharing Retrieval Subsystem (TRS) on the H6000 computer. It applies to all functional user personnel who have a requirement for batch and/or online retrievals from data bases resident on the H6000 computer. The information in this volume is used in conjunction with the operational information found in AFM 171-714, Volume I, and the Computer Directed Training System (CDTS) course designed to teach the use of SIS.

NOTE: This manual has been written to be easily understood by its primary audience. However, there are certain words that are commonly used in performing the functions described here. These are listed in paragraph 1.3 titled "Terms and Abbreviations." We advise you to review them before reading this document.

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PART TWO - SELECTIVE INQUIRY SYSTEM (SIS)	

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## PART ONE - INTRODUCTORY INFORMATION

## SECTION 1. GENERAL

1.1 Purpose of the Users Manual. The objective of this Users Manual for the Selective Inquiry System (SIS), DSD S037, is to provide the users with the information necessary to effectively use the batch system and the Timesharing Retrieval Subsystem (TRS).

1.2 Project References.

- a. Honeywell Control Cards Reference Manual, BS19.
- b. Honeywell General Loader, DD10.
- c. Honeywell Source and Object Library Editor, BJ71.
- d. Honeywell General Comprehensive Operating Supervisor (GCOS), BR43.
- e. Honeywell TSS General Information Manual, DD22.
- <sup>C7</sup> f. AFM 171-604, Volumes I and II, Parts 1 and 2, H6000.
- \* Utility Software: S891/ZA, 1 December 1976.
- g. AFM 171-714, Volume I, Selective Inquiry System (SIS): S037/QI, 7 March 1978.

1.3 Terms and Abbreviations.

- a. Scientific collating sequence is the Honeywell standard as documented in AFM 171-100, Volume II.
- b. Job Control Language (JCL) is the necessary control cards used to execute programs and allocate input/output files.
- c. Selective Inquiry System (SIS) is the batch version of the retrieval system.
- d. Timesharing System (TSS) consists of an executive program, a number of independent processing subsystems which execute under the executive, and a common command language.
- e. Timesharing Retrieval Subsystem (TRS) is the portion of SIS which executes as a subsystem to the TSS executive.
- f. Available File Table (AFT) is a table provided each terminal under TSS and holds a maximum of 20 file names to which the user has current access.

g. Beginning-of-File (BOF) is a message displayed at a TSS terminal to indicate to print file is positioned at the beginning-of-file.

h. End-of-File (EOF) is a message displayed at a TSS terminal to indicate the print file has reached end-of-file. This message is immediately followed by "/BOF" to indicate automatic positioning of the file to BOF.

i. Teletype Terminal (TTY) is any hard-copy terminal supported by TSS and made to appear as a teletype for line control purposes, such as a Texas Instruments Silent 700.

j. Visual Information Projection (VIP) is a cathode ray tube display device supported by TSS.

k. File Description (filedescr) is the name of a quick access file or a complete catalog/file name description.

\* l. SORT (Phase II) includes the MERGE function in SIS, unless specifically excluded in the text.

1.4 Security and Privacy. The SIS/TRS programs themselves are unclassified and contain no system of security protection or privacy. It is the user's responsibility to provide file protection and security for any classified and/or privacy data entered as input. Reference figures 4-16 and 4-17 for specific information.

## PART TWO - SELECTIVE INQUIRY SYSTEM (SIS)

## SECTION 3. SYSTEM SUMMARY

3.1 System Application. The purpose of SIS is to provide a batch program for retrieving and reporting of data from single or multiple files. It provides the capability to respond to most reporting needs with a minimum of lead time and minimizes the need for programmers to develop tailored programs to produce new reports from a data base. Savings can also be realized both in programming and computer time by the virtual elimination of the debugging required for tailored programs. In addition, report requirement changes are easily incorporated using SIS, usually by changing a minimum of statements.

3.2 System Operation. NA

3.3 System Configuration. SIS is designed for use on any Honeywell H6000 computer with the Extended Instruction Set and will operate under any WWMCCS release, from 5.3.4 forward.

3.4 System Organization. The SIS system consists of three phases which may be executed individually or in combination, depending on the specific user requirement or application.

3.4.1 Editing and Selection. Phase I is an editing and selection phase and consists of the following programs:

QIE8FO (EDIT program on file code H\*)  
QIE1FO (Save SELECT phase on file code RI)  
QIE2FO (SELECT phase)

3.4.2 Sort and Comparison. Phase II is a sort and comparison phase and consists of the following programs:

QIE3FO (Save SORT phase on file code RS)  
QIE4FO (SORT phase)  
QIE5FO (Comparison coding generator for SORT)

3.4.3 Report Generation. Phase III is a report generation phase and consists of the following programs:

QIE6FO (Save REPORT phase on file code RR)  
QIE7FO (REPORT phase)

3.4.4 Logic Statement Analyzer. Program QIE9FO is the Logic Statement Analyzer and is used by all three phases. This program also saves values on PARAM card(s) and substitutes the values into card images prior to each phase's analyzing the card.

- 3.4.5 Syntax Error Termination. If control card syntax errors are found, SIS is terminated normally with bit 21 of the program switch word set on. This bit may be tested with a \$ IF JCL card to control execution of subsequent activities.
- \* If an abort on syntax errors is desired, reference paragraph 4.2.2.5.1 (SYNABT option).

3.5 Performance. The SIS allows great flexibility on the part of the user regarding types of input, selection and sort capability, and report generation.

- 3.5.1 Phase I. Phase I accepts input files in system standard data compacted, or Indexed Sequential Processor (ISP) formats, optionally matching another file in the same sequence. In addition, data may be retrieved from up to five auxiliary ISP input files. Records may be generated in up to 64 different formats on up to eight output files. Such output records may contain data from any or all input files, including calculated values and literals. Selection criteria based on comparison conditions using AND and OR logic may be applied to both input and output files.
- 3.5.2 Phase II. Phase II will read up to eight system standard or data compacted files, apply optional selection criteria and write one system standard format file. Compacted files may not be used with the MERGE function of SIS.
- \* 3.5.3 Phase III. Phase III will read a system standard or data compacted file, apply optional selection criteria, and generate a printed report, system standard data file, or both. The printed report can contain detail lines and/or summarizations at up to nine levels plus final totals. Page headings, column headings, product control numbers, classification, editing, group suppression and zero suppression are available. (Users should insure that the use of the above data elements comply with AFM 171-100 standards.)
  - \* 3.6 Data Base. SIS/TRS will accept either sequential or ISP files and data bases (paragraph 3.5.1). The use of a specific file or data base is the decision of the user based on the requirements of the application.

3.7 General Description of Input, Processing, Outputs:

3.7.1 Inputs. Inputs are determined by each user as necessary for local requirements of unique functional applications;

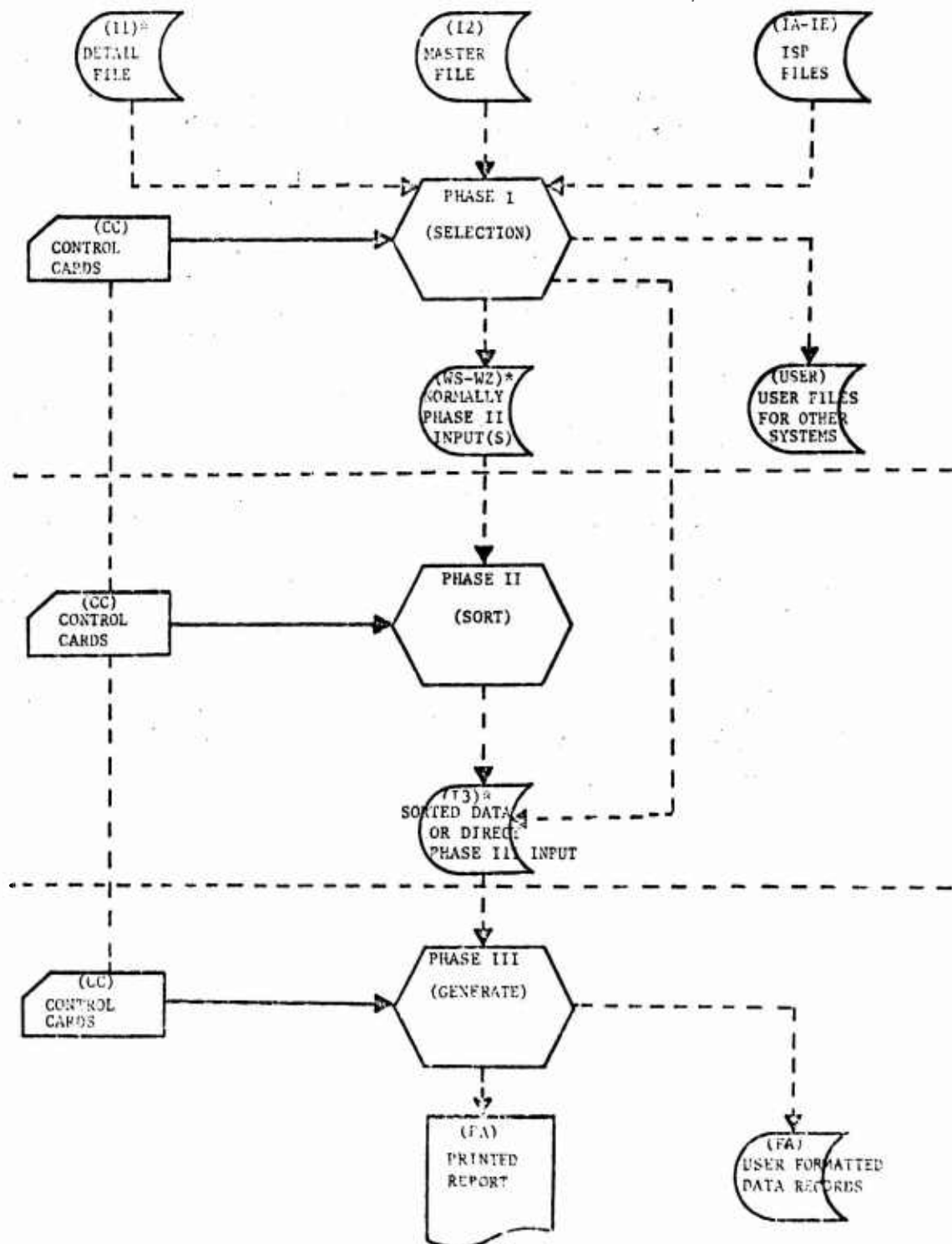
SIS INPUT/OUTPUT FILES

Figure 3-01. SIS Input/Output Files.

- \* however, the following actions are taken for logical records from file codes I1, I2, WS - WZ, and I3. Variable length records may be used for system standard files. Files used as input to the MERGE function of SIS Phase II, compacted and ISP files must contain fixed length records. System standard and decompacted records are always considered to be 256 words in length, with all character positions beyond the actual length, if any, filled with blanks. If an input file contains print image data (media code 3) records, the last word of each record is assumed to be a slew word and is blanked out in the logical record area. If the record is only a slewing word, it is bypassed and a count is displayed at EOF. The input file(s) should not contain HDRECs when used with Phases II and III if media code 3 records are input. The maximum record size that SIS will read/write is 256 words or 1536 characters.

3.7.2 Processing. The specific SIS options used during processing are determined by each user according to application.

3.7.3 Outputs. Quantity, type, and format, of the output from SIS is determined by each user as per the necessary local requirements for unique applications. (AFM 171-100 should be referenced to insure compliance with standards.)

3.8 Field Assistance. For assistance in preparing Difficulty Reports (DIREPs) and/or Incident Reports, contact AFSDC/SDMC, AUTOVON 921-4305.



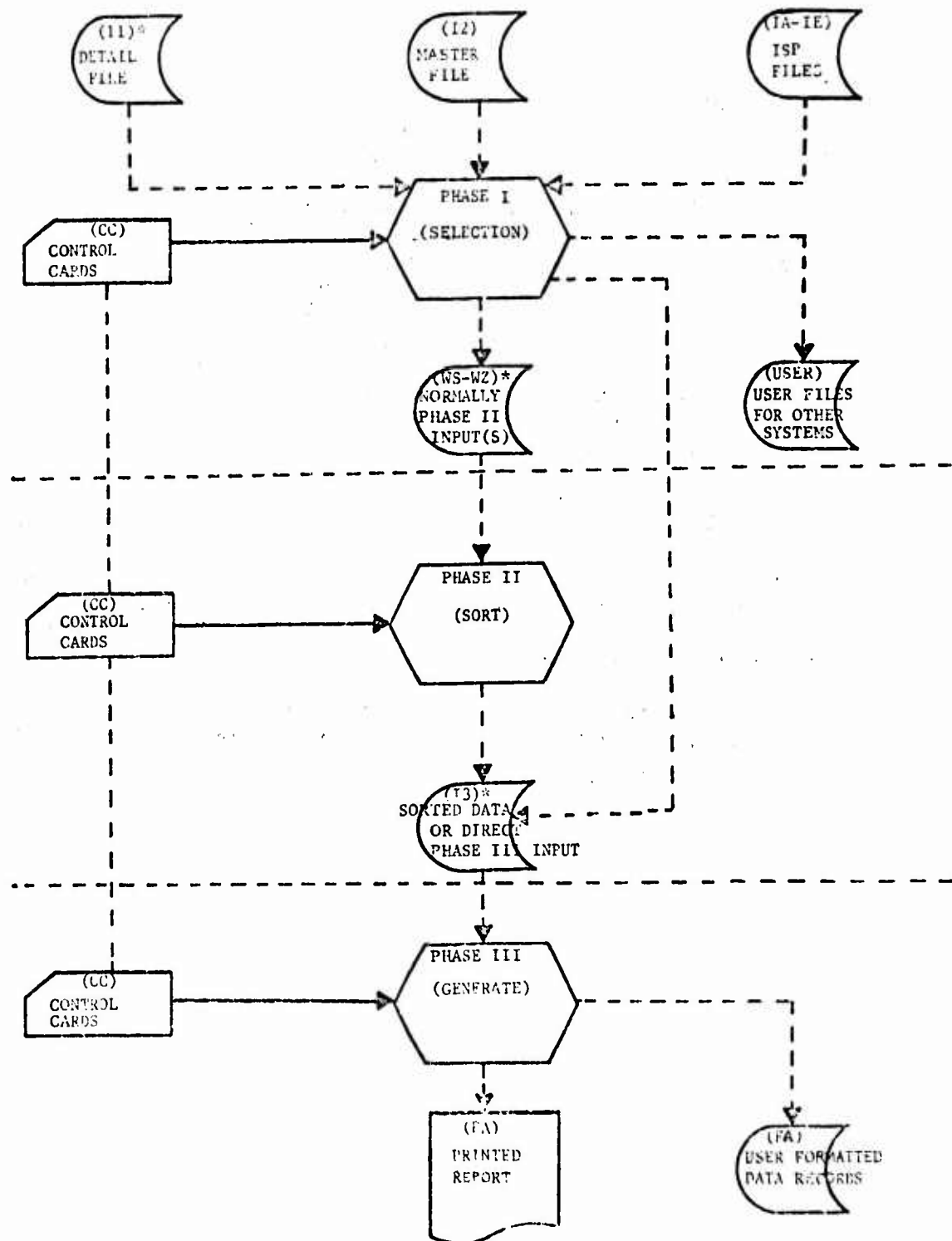
SIS INPUT/OUTPUT FILES

Figure 3-01. SIS Input/Output Files.

- \* however, the following actions are taken for logical records from file codes I1, I2, WS - WZ, and I3. Variable length records may be used for system standard files. Files used as input to the MERGE function of SIS Phase II, compacted and ISP files must contain fixed length records. System standard and decompacted records are always considered to be 256 words in length, with all character positions beyond the actual length, if any, filled with blanks. If an input file contains print image data (media code 3) records, the last word of each record is assumed to be a slew word and is blanked out in the logical record area. If the record is only a slewing word, it is bypassed and a count is displayed at EOF. The input file(s) should not contain HDRECs when used with Phases II and III if media code 3 records are input. The maximum record size that SIS will read/write is 256 words or 1536 characters.

3.7.2 Processing. The specific SIS options used during processing are determined by each user according to application.

3.7.3 Outputs. Quantity, type, and format, of the output from SIS is determined by each user as per the necessary local requirements for unique applications. (AFM 171-100 should be referenced to insure compliance with standards.)

3.8 Field Assistance. For assistance in preparing Difficulty Reports (DIREPs) and/or Incident Reports, contact AFSDSC/SDMC, AUTOVON 921-4305.

## FILE CODES

## PHASE I

<u>FILE CODE</u>	<u>CONTENTS OF FILE</u>	<u>I/O</u>	<u>REQ'D</u>	<u>NOTES</u>
CC	SIS Control Cards	I	YES	
* I1	DETAIL Input (System Standard, Compacted or ISP format)	I	YES	
Z1	DETAIL Index	I	YES	Required if file I1 is ISP format.
* I2	MASTER File (System Standard or ISP format)	I	NO	
* Z2	MASTER Index	I	NO	Required if file I2 is used and is ISP format.
IA/ZA	Auxiliary input ISP data (IA) and index (ZA).	I	NO	Required if IB/ZB are used.
IB/ZB	Auxiliary input ISP data (IB) and index (ZB)	I	NO	Required if IC/ZC are used.
IC/ZC	Auxiliary input ISP data (IC) and index (ZC)	I	NO	Required if ID/ZD are used.
ID/ZD	Auxiliary input ISP data (ID) and index (ZD)	I	NO	Required if IE/ZE are used.
IE/ZE	Auxiliary input ISP data (IE) and index (ZE)	I	NO	
WS	User formatted records	O	NO	*
WT	User formatted records	O	NO	*
WU	User formatted records	O	NO	*

Figure 3-02. File Codes.

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<u>FILE CODE</u>	<u>CONTENTS OF FILE</u>	<u>I/O</u>	<u>REQ'D</u>	<u>NOTES</u>
WV	User formatted records	O	NO	*
WW	User formatted records	O	NO	*
WX	User formatted records	O	NO	*
WY	User formatted records	O	NO	*
WZ	User formatted records	O	NO	*If data is being passed to the sort (Phase II), it must be on this (these) file codes.
* I3	User formatted records	O	NO	Required if data is being passed directly from Phase I to Phase III.

- \* NOTE: If Phase II (Sort) is executed, all data on file codes WS through WZ will be read. The only output of Phase II is file code I3. If Phase I is being executed alone, or only with Phase III, file codes WS through WZ may be used to create any user output records, as desired.

Figure 3-02. File Codes. (cont'd)

## PHASE II

<u>FILE CODE</u>	<u>CONTENTS OF FILE</u>	<u>I/O</u>	<u>REQ'D</u>	<u>NOTES</u>
CC	SIS Control Cards	I	YES	
WS	User formatted records from Phase I or pre- existing data	I	YES*	
WT	Same as file code WS	I	YES*	
WU	Same as file code WS	I	YES*	
WV	Same as file code WS	I	YES*	
WW	Same as file code WS	I	YES*	
WX	Same as file code WS	I	YES*	
WY	Same as file code WS	I	YES*	
WZ	Same as file code WS	I	YES*	*The input data to be sorted or merged must be on one or more of these file codes. See NOTE below.
I3	Sorted/merged output records	O	YES	This data is usually passed to Phase III; however, it may be written to a PRMFL or tape and saved without executing Phase III.

NOTE: The sort/merge will read all files assigned to file codes WS - WZ. The first file code does not have to be WS. Effective with the 10/79 block release, system standard files and/or files compacted IAW AFM 171-604, Volumes I & II, Parts 1 & 2, may be mixed in any combination if the function is a SORT. Only system standard files in Honeywell (scientific) collating sequence may be used with the MERGE function.

Figure 3-02. File Codes. (cont'd)

## PHASE III

<u>FILE CODE</u>	<u>CONTENTS OF FILE</u>	<u>I/O</u>	<u>REQ'D</u>	<u>NOTES</u>
CC	SIS Control Cards	I	YES	
I3	Data from Phase I or II or any system standard or compacted format file. If CTL breaks are used, file should be in sequence by the fields used.	I	YES	
PA	Report output	O	YES	Required if any PRT control card are present for PHASE III. The report code for this output is 21.
FA	Data record output	O	YES	Required if any RCD control card are present for PHASE III.

Figure 3-02. File Codes. (cont'd)

#### SECTION 4. STAFF FUNCTIONS RELATED TO TECHNICAL OPERATIONS

4.1 Initiation Procedures. The procedures for initiating system operation; i.e., Job Request Forms, etc., will be determined by each DPI and user.

4.2 Staff Input Requirements. The requirements to be observed in preparing entries to the system (cause of input, time of input, medium of input, etc.) is determined by each user according to local applications and procedures.

4.2.1 Input Formats. The input formats for files or data bases used with SIS are dependent on each user's choice of which local files or data bases are utilized.

4.2.2 Composition Rules:

4.2.2.1 Detail and Master Files. For the purpose of SIS, all references to "Detail" and "Master" files should be considered as if the "Detail" file is a series of transactions that is being processed against an existing larger file, called the "Master" file. The "Detail" records cause all other actions to be taken within Phase I.

4.2.2.2 Basic Execution JCL. The execution of SIS is initiated by a Honeywell utility program called "RLHS", the function of which is to load an "H\*" format file into core. The first program loaded is the edit phase and always has the file code "H\*". The Selection, Sort/Merge and Report Phases are contained on other "H\*" format files with the file codes of "RI", "RS", and "RR" respectively. In addition, if Phase III is executed, the report is produced on file code "PA". The minimum JCL required to execute SIS is shown below and does not include any input, work or output files. Table 4-02 may be used to determine the additional file codes required.

\$	PROGRAM	RLHS,ON1,DUMP
\$	PRMFL	H*,R,R,catalog/RQIE8FOAU00
\$	PRMFL	R1,R,R,catalog/RQIE1FOBU00
\$	PRMFL	RS,R,R,catalog/RQIE3FOCU00
\$	PRMFL	RR,R,R,catalog/RQIE6FODU00

4.2.2.3 Control Cards/Input Data. The basic execution JCL shown above should be used as a starting point for the JCL to execute SIS. The user must add the SIS control cards as file code "CC". For certain SIS retrievals the control cards may be encoded prior to being released to preclude modifications to a standard product. These cards will not print during the edit phase and may only be read by SIS, not TRS. Files which have been compacted IAW AFM 171-604, Volume II, Parts 1 and 2, may be used as input on file codes "I1", "WS" through "WZ" (only with SORT function), and "I3". Compacted files may not be used with the MERGE function.

4.2.2.4 Control Card Accuracy. To insure the accuracy of control cards, the user should have the input record format(s) and the desired output format(s) available prior to preparing the control cards. The control cards must be present on file code CC and in the sequence shown below. Card type is always punched starting in column 1. Variable data cannot begin before column 7 and cannot extend beyond column 78. If the TSS subsystem CARDIN is used to create SIS jobs, line numbers must be stripped when the job is run. For WRIT and RCD cards in Phase I, the format code may be any of the 64 BCD characters and must be submitted in Honeywell collating sequence as shown in AFM 171-100, Volume II, Figure 3-01. The same applies to the sequential character in column 5 of PRT and RCD cards in Phase III.

NOTE: The percent sign (%) character cannot be used as a format code if PARAM cards are present (see below).

4.2.2.5 Control Card Sequence. The following is a list of all possible control cards, and are shown in the sequence they must appear when used. (Table 4-02 may be used in determining when each type is needed.)

	OPTION	
	PARAM	
PHASE I:	CONCAT	(SIS only)
	HDREC	
	DTL	
	MST	
	MATCH	
	ISP	
	HOLD	
	IF	
	CNTRS	
	COMPUT	
	WRIT	
	RCD	
PHASE II:	LABL	(also Phase III)
	SORT	(or MERGE in SIS only)
	SIZES	
	SELECT	(Reference Figure 4-14) CR
PHASE III:	SELECT	
	HDREC	
	LINES	
	CLASS	
	FOOT	
	HEAD	
	HOLD	
	CTL	
	IF	



CNTRS  
COMPUT  
TABL  
PRT/RCD

4.2.2.5.1 OPTION Card. The OPTION card is used to inform SIS that bit settings in the Program Switch Word (PSW) are to be ignored for this activity. Keyword values may be used to direct SIS in performing the retrieval and/or to change the size of the record HOLD areas, request additional core or that a dump be taken if SIS aborts. If used, it must be the first card in the deck and only one OPTION card may be present. The options chosen, if any, start past column 6 and are separated by commas with no intervening spaces. The following keywords are used to activate the options. (The referenced bits are described in paragraph 4.2.4.4.)

<u>SPACES</u>	Corresponds to bit 22.
<u>WRITONE</u>	Corresponds to bit 23.
<u>NOLIST</u>	Corresponds to bit 27.
<u>NOCOMPACT</u>	Corresponds to bit 30.
<u>NOVAR</u>	Corresponds to bit 31.
<u>COREnn</u>	Where nn is the number of 1K blocks of core to be added after execution begins. Maximum is 64.
<u>HSZnnn</u>	Where nnn is the size of the HOLD areas in Phases I and III if the default of 20 words is not sufficient. Must be three characters and may range from 020 - 256 words.
<u>PARAMS</u>	This keyword caused the "before" images of control cards to print if (1) PARAM card is present and (2) NOLIST was not specified and (3) the control card contains a parameter substitution request (i.e.; %nn). The "before" image is predated by three asterisks.
<u>DUMP</u>	This option may be used if the \$ PROGRAM card used to execute SIS is on a SELECT or SELECTA file and does not contain the DUMP parameter, but a dump is needed to send to AFSDSDC.
<u>SYNABT</u>	This option may be used if it is desired to have SIS abort with an "A1" abort code if syntax errors are found. (Reference paragraph 4.5.2.)
<u>CHECK</u>	This option causes only syntax checking of control cards. The jobstream is not checked for the presence of the proper files. If errors are found, a "CF" abort will occur.

NOTE: Except in the case of COREnn and HSZnnn, only the last three characters of each keyword are significant. If an option is not to be used, omit the keyword.

**4.2.2.5.2 PARAM Card.** A maximum of 22 PARAM cards may be used to specify the values for up to 50 parameters defined within the retrieval. The entries on the PARAM card(s) are positional; i.e., the first parameter is always referred to as %01 (see below). The PARAM card(s), when used, must precede any Phase I, II, or III control cards and follow the OPTION card, if present. The following rules apply:

a. Parameter values are coded starting in cc 7 and are separated by commas. No imbedded spaces are allowed except inside quotation marks (i.e., a literal). Several field definitions may be coded as one parameter by enclosing the string in apostrophes (e.g., PARAM "LIT", "EXAMPLE", 23/1, 47/4, 52/5'). The string inside the apostrophes will be referenced as %02. This feature can be useful when the same values are to be repeated on several cards, such as multiple RCD statements. The duplicated field definitions may be coded once on the PARAM card and be automatically substituted in all other places.

b. The last parameter value on all PARAM cards must end prior to cc 78 and must not end with a comma.

c. Any value within a retrieval may be parameterized. If it is a quoted literal, the quotes must be included in the PARAM card. This allows the use of the percent sign within literals (i.e., the value between quotation marks is not examined for substitution).

d. After substitution of PARAM values, the control card must be contained within cc 1-78. The control card listing, if produced, will contain the substituted values.

e. Reference to a parameter is signalled by a percent sign (%) immediately followed by a two-digit number indicating the relative position of the parameter on the PARAM card(s) (e.g., %05 for the fifth parameter).

The following is an example of a retrieval which will create either a printed report or an output file in Phase III, depending on the values in the PARAM card:

CODED: PARAM PRT01,CC01	EXECUTES: PARAM PRT01,CC01
LINES	LINES
%01   %02,1/80	PRT01 CC01,1/80

To cause record creation instead of print lines, code the PARAM card as follows:

CODED: PARAM RCD01,L14	EXECUTES: PARAM RCD01,L14
LINES	LINES
%01   %02,1/80	RCD01 L14,1/80

- 4.2.2.5.3 CONCAT Card. The CONCAT card is used to specify to Phase I of SIS that up to six additional files are to be read as if they were extensions of file code "I1". Each file is read in its entirety before the next file is opened. The file code assignments are arbitrary except as noted below. In addition, the user may specify that "Y" counters be reset when each file is opened by placing the value "RESET" in columns 19-24. The file codes to be read are listed starting in column 7 and may continue through column 18 with no spaces. As an example, six additional file codes (F1 - F6) could be read as follows:

\* CONCATF1F2F3F4F5F6

The additional files would be assigned to file codes F1 through F6. File code "I1" is always read first. The following card would be used to concatenate file code "XX" to file "I1" and reset the "Y" counters when "XX" is opened:

CONCATXX                      RESET    (unused columns must be blank)

The following restrictions apply when CONCAT is used:

- a. None of the file codes assigned may correspond with a SIS file code; e.g., "I2", "WS", etc.
- b. No ISPDTL or MATCH cards may be present.
- c. If the "Unnnn" option is used on the DTL card, end-of-file will be assumed no matter which file is being read.
- d. If a heading record is specified as input, only the file "I1" is assumed to contain a header record.
- e. File codes beginning with the letter "S" should be avoided if Phase II is being executed.
- f. File code "I1" and all concatenated files must be in system standard format; i.e., no compacted or ISP files are allowed.
- g. The CONCAT card will not cause an error if present in a TRS RUNB/RUND command. However, there will not be any file allocation prompts for these files. Use the RUNBN option to save the generated JCL, modify it with CARDIN to include the concatenated file(s) JCL, and run through CARDIN as a batch job.

4.2.2.6 Comment Cards. Comment cards, denoted by an asterisk in column 1, may be placed anywhere within the deck. All cards and comments will be listed on SYSOUT (P\*) unless a \$ SET 27 JCL card, or an OPTION card with NOLIST specified, is present in the jobstream. If an error is encountered, the error message and all remaining cards will list regardless of the suppression request.

4.2.2.7 Error Messages. If any errors are found during editing, processing is terminated with bit 21 of the PSW set on. Explanatory message(s) print following the card(s) in error. Paragraph 4.5.1 contains detailed explanations of the error messages. As with all syntax editors, some errors may cause other errors to be generated that will not exist when the real error is corrected. If an abort is desired when syntax error(s) are found, reference paragraph 4.2.2.5.1 (SYNABT option).

4.2.2.8 Logic Statements. The DTL, MST, HOLD, IF, WRIT and SELECT control cards require logic statements to identify the type of data being manipulated. Paragraph 4.2.4.2 contains detailed information on the coding of logic statements and should be read prior to using any of the above control cards.

4.2.2.9 Control Cards by Phase. Figures 4-01 through 4-28 are all of the allowable control cards by phase, in the order they must appear when used. Each card format is described and is followed by at least one example of its use.

4.2.3 Input Vocabulary. Legal character combinations or codes to identify or compose input items are dependent on each user's choice of files and data bases to be utilized in conjunction with SIS.

#### 4.2.4 Sample Inputs:

4.2.4.1 Record Area Prefixes. Certain control cards allow references to many sources of the data to be worked with. To signal SIS where the data is to be obtained, record area prefixes are used. The valid prefixes are listed below, along with their meanings. Each control card description defines which prefixes may be used on that card.

<u>Prefix</u>	<u>Data Source When Prefix is Used</u>
H	HDREC control card must be present. Data are obtained from the 20 word, or 120 character, record that was held in this area. If no HDREC control card was present, dollar signs will be obtained.

<u>Prefix</u>	<u>Data Source When Prefix is Used</u>
HA	HOLDA control card should be present. Data are obtained from the record that was held because it met the HOLDA logic criteria. The hold area may be 20 words by default, or the user may specify up to 256 words for each hold area on the OPTION card (paragraph 4.2.2.5.1).
HB	Same as HA, except for HOLDB cards.
HC	Same as HA, except for HOLDC cards.
M	MATCHD/MATCHM control cards should be present. Data are obtained from the first 256 words of the current "master" file record or blanks if no matching record was found. This prefix is only valid in Phase I control cards.
D	This prefix is used in Phase I to reference the current detail record, up to a maximum of 256 words (1536 characters). The D prefix may be omitted except in WRIT control cards (figure 4-10) when referencing the detail record.
IA-IE	ISPA through ISPE control cards should be present. IA specifies that the data are to be obtained from the current record in the ISPA record area, etc. These prefixes are valid only in Phase I.
	NOTE: If any prefixes are used without the corresponding control card, dollar signs will be inserted and the control card listing will contain warning messages in the following format: ---> WARNING-PREFIX xx USED W/O CONT CARD These messages are for information only and will not cause termination of the retrieval if no other errors are found.

4.2.4.2 Logic Statements. The SIS logic statement is similar to COBOL except that record positions are used instead of field names. A logic statement is required on MST, HOLD, IF and WRIT statements, and usually are coded on DTL and SELECT cards also. Each statement may be on up to 21 cards. The following special characters are used as delimiters and operators in SIS and TRS logic statements:

- |   |  |
|---|--|
| = | Used for comparisons which must be equal to be true.   |
| - | Used for comparisons which must be unequal to be true. |

- " Delimits alphanumeric literals.
- / Delimits binary values in literal expressions.
- # Delimits fields within the same record, or other record areas.
- ( ) Used for grouping logical data when mixing AND and OR conditions.

#### 4.2.4.2.1 Rules for Coding Logic Statements.

- a. Elements within a logic statement must be separated by at least one space.
- b. A logic statement should be terminated with a period, but is supplied by SIS if omitted.
- c. All literal values being compared to the same record position(s) must be the same length and cannot exceed six characters. The special characters # and / may not be used in a literal on a logic statement.
- d. Nesting of conditions cannot exceed a depth of 20 (i.e., a maximum of 20 left parentheses may be open at one time).
- e. Range tests (using TO) are in Honeywell standard sequence for quoted literals and algebraic for binary literals. Range tests may be made using another field's contents by enclosing that field descriptor in pound signs (#).

4.2.4.2.2 Conditional Expressions. There are two types of conditional statements, simple and compound. A simple conditional statement consists of checking the contents of a field for the presence or absence of a specific value. A compound conditional statement consists of two or more simple conditionals combined with the words AND or OR. If the AND connector is used, both simple conditions surrounding it must be true to satisfy the logic. If the OR connector is used, any simple conditional with a true value causes the entire statement to be true. Table 4-01 summarizes these results.

TABLE 4-01

TRUTH TABLE

IF a is	and b is	then a and b is	and a or b is
true	true	true	true
false	true	false	true
true	false	false	true
false	false	false	false

Normal processing of conditionals requires that a certain sequence be used when evaluating compound conditions. The user may direct processing sequence by grouping simple conditionals and logical connectors with the use of parentheses. The need for precedence rules becomes obvious with the following example. (A and B are true, C is false.)

(A OR B) AND C      The entire statement is false because C is false.

A OR (B AND C)      The entire statement is true since A is true.

If parentheses are not used, conditions are logically grouped by AND from left to right, and then by OR from left to right. For example, note the progression of the following evaluation:

C1 OR C2 AND C3 AND C4 OR C5 AND C6

Using the first part of the rule above, C2 AND C3 are internally grouped, yielding:

C1 OR (C2 AND C3) AND C4 OR C5 AND C6

The next internal grouping occurs around the AND preceding C4, resulting in:

C1 OR ((C2 AND C3) AND C4) OR C5 AND C6

Internal grouping around the final AND yields:

C1 OR ((C2 AND C3) AND C4) OR (C5 AND C6)

Finally, internal grouping around OR gives:

(C1 OR ((C2 AND C3) AND C4)) OR (C5 AND C6)

If parentheses are used, conditionals must always be paired as in algebra. Innermost expressions are evaluated first.

When using the not equal (-) comparison in SIS, the logical value of parenthesized conditionals are reversed, as follows:

DTL      (16="XXXXXX" AND 22="XXX") OR  
DTL      (16="YYYYYY" AND 22="YYY") OR  
DTL      (16="ZZZZZZ" AND (22="ZZZ" OR "AAA")).



To cause records to be used that meet the exact opposite of the above criteria the following rules are observed:

- a. All equal signs are changed to not equal signs (-).
- b. All ANDs are changed to ORs.
- c. All ORs are changed to ANDs unless it is connecting a series of values to be compared to the same record position, as where 22 = "ZZZ" OR "AAA" above.

Following these rules, the above example would be coded:

```
DTL (16 - "XXXXXX" OR 22 - "XXX") AND
DTL (16 - "YYYYYY" OR 22 - "YYY") AND
DTL (16 - "ZZZZZZ" OR (22 - "ZZZ" OR "AAA"))).
```

4.2.4.2.3 Logic Statement Examples. (In the examples, specific control card references are used. However, logic statements may be coded on six types of cards.)

a. Example 1. If the user wants to select all records that contain "E" in position 46 or "01" or "02" in positions 46-47 of the "detail" file in Phase I, the following would be coded:

```
DTL 46 = "E" OR 46 = "01" OR "02".
```

NOTE: The field starting position (46) had to be repeated to prevent violation of rule C for coding logic statements. The values enclosed in quotation marks are called literals.

b. Example 2. If the user wants to hold any "detail" record in Phase I that contains any value between "02" and "63" inclusive in columns 24-25, the following would be coded:

```
HOLDA 24 = "02" TO "63".
```

NOTE: The word "TO" is used, but logically means "THROUGH" (i.e., to exclude records with "63" above, change the value to "62").

c. Example 3. The user wants to select records to enter Phase III that contain "AB" or "AD" or "00" TO "93" in columns 9-10.

```
SELECT 9 = "AB" OR "AD" OR "00" TO "93".
```



NOTE: While the above format will execute properly, the following may be used to aid readability:

SELECT (9 = "AB" OR "AD") OR (9 = "00" TO "99").

d. Example 4. The user wants to process all records that do not contain "MX" or "LT" in positions 16-17.

SELECT 16 - "MX" OR "LT".

NOTE: The hyphen (-) character is used to mean "not equal to be true." In this case, only records which do not contain "MX" or "LT" will be selected for further processing.

e. Example 5. The user wants to hold all records which contain the value 423 in pure binary form in positions 7-12.

HOLDA 7 = /423/.

\* NOTE: A binary literal is distinguished by the delimiters of slashes instead of quotation marks. Binary fields are always considered to be six character positions in length (36 bits) and do not have to lie on a word boundary. A minus sign may be used to indicate the literal is negative (e.g., /-346/).

f. Example 6. In Phase I, the user wants to select all records that match positions 6-10 of the HDREC record on the "detail" file.

DTL 6 = #H6/5#.

\* NOTE: To compare to other fields in the same or another record area, the descriptor is enclosed between pound signs. The "H" prefix above signals that the data to be compared against is in the HDREC area (paragraph 4.2.4.1). The maximum value for the length portion is six. If a field of greater than six characters is needed, it can be broken up as follows: DTL 6 = #HA6/6# AND 12 = #HA12/5#.

g. Example 7. There are two record types on the "detail" file, identified by an "A" or "B" in position 80. All "A" records containing "63A" in positions 27-29 are to be selected; as are all "B" records containing "M6453A74" in positions 16-23.

DTL (80 = "A" AND 27 = "63A") OR  
DTL (80 = "B" AND 16 = "M6453A" AND 22 = "74").

\* NOTE: The value "M6453A74" had to be split into two literals due to rule c for coding logic statements (paragraph 4.2.4.2.1).

4.2.4.3 Coding Examples.

4.2.4.3.1 Example 1. Sort a system standard file into sequence on name field of the record format shown below. Count all GS-5s and GS-7s and a total of employees in other grades. Show only the name and grade on the output listing, plus the totals indicated at final total only.

RECORD FORMAT. (file code WS)

Positions 1-20 Employee Name  
 Positions 21-22 GS Grade Level  
 Positions 23-31 Social Security Number  
 Positions 32-34 Skill Codes

REPORT FORMAT. (file code PA)

## SIS EXAMPLE ONE

```

XXXXXXXXXXXXXXXXXXXXXX  XX
XXXXXXXXXXXXXXXXXXXXXX  XX
XXXXXXXXXXXXXXXXXXXXXX  XX
  
```

TOTAL 7=x TOTAL 5=y TOTAL OTHER=z

CONTROL CARDS.Footnote

SOFT		
<del>SOFT</del>	1,20,A	1
SIZES	6,6	2
HEAD	CCT2,20S,"SIS EXAMPLE ONE"	3
IF01	21 = "07"	4
IF02	21 = "05"	4
IF03	21 - "07" OR "05"	5
CNTRS	C1 = XIF01, C2 = XIF02, C3 = XIF03	6
PRT01	CC01,1/20,5S,21/2	7
PRTF2	CC20, "TOTAL 7=", C1D/2, " TOTAL 5="	8
PRTF2	C2D/2, " TOTAL OTHER =", C3D/2	8

Footnotes:

- 1 This card controls sorting positions 1-20 of the input records into ascending sequence.
- 2 This card is required when the sort is used. It specifies the record size of the output from the sort phase. Since only the first few words of the record are needed, it is more efficient to write six-word records than 14-word records, assuming the input was card image BCD.

- 3 This card supplies the report heading. The first field (CCT2) skips to the top of the page before printing the heading and skips two spaces after printing. The second field (20S) supplies 20 spaces on the print line. The third field supplies the literal value to be printed.
- 4 These cards set internal switches to TRUE or FALSE depending on the contents of positions 21-22 of the current input record. Positions 21 and 22 are examined because the literal value specified is two characters in length.
- 5 This card sets a switch to TRUE or FALSE using the "not-equal" feature (-). The condition is TRUE if positions 21-22 are not "07" or "05" and FALSE if positions 21-22 are equal to either of these values.
- 6 This card adds one (X) to counter one (C1) if condition switch IF01 is on (TRUE), etc., for C2 and C3. Note that only one of these counters will be updated for each record since only one of the IF conditions can be true.
- 7 This card describes the detail print line required for the output report.
- 8 These cards describe the format of the final total line.  
NOTE: The length of fields being printed from counters should always be large enough to display the maximum number of significant digits expected. In the example, only two print positions are allowed for each counter. If any counter contains more than 99, significant digits would be lost.

#### 4.2.4.3.2 Example 2:

Using the same data file as example 1, select only employees whose last name begins with "B", "C" or "E" and sort by name within grade. Count the number of employees for each letter selected. Print minor totals for each grade. Detail print line is shown below. The input data will be on file code WS.

#### REPORT FORMAT.

EMPLOYEE NAME	GRADE	SSN	SKILL CODES
XXXXXXXXXXXXXXXXXXXX	XX	XXX-XX-XXXX	XXX
XXXXXXXXXXXXXXXXXXXX		XXX-XX-XXXX	XXX
B=nn C=nn E=nn			
XXXXXXXXXXXXXXXXXXXX	XX	XXX-XX-XXXX	XXX
B=nn C=nn E=nn			
B=nn C=nn E=nn			

CONTROL CARDS.Footnote

SORT	21,2,A, 1,20,A	1
SIZES	6,6	2
SELECT	1 = "B" OR "C" OR "E"	3
HEADA	CCT0, 49S, "SKILL"	4
HEADB	CC12, 3S, "EMPLOYEE NAME", 9S, "GRADE", 8S	4
HEADB	"SSN", 8S, "CODES"	4
CTL	B1 = 21/2	5
IF01	1 = "B"	6
IF02	1 = "C"	6
IF03	1 = "E"	6
CNTRS	C1 = XIF01, C2 = XIF02, C3 = XIF03	7
PRT01	CC01, 1/20, 6S, 21G2, 6S, 23/3, "-", 26/2	8
PRT01	"-", 28/4, 5S, 32/3	8
PRT12	CC13, "B=", C1A/2, " C=", C2A/2, " E="	9
PRT12	C3A/2	9
PRTF3	CC30, PRT12	10

Footnotes:

- 1 This card control sorting on positions 21-22 as the major key and positions 1-20 as the minor key. Both fields are in ascending sequence.
- 2 Same as example 1, footnote 2.
- 3 The SELECT card is used to eliminate unwanted records from the sort. That is, only records with a "B", "C" or "E" in position 1 will be passed to the sort and, therefore, Phase III.
- 4 These cards provide the heading lines required by the report format.
- 5 This card is required since the problem statement called for minor total breaks on the grade field.
- 6 These cards set TRUE and FALSE conditions depending upon the contents of position 1 of each record. Only one of these conditions can be TRUE since all IF statements check the same record position.
- 7 This card controls addition to counters C1 - C3. A one will be added to each counter if its matching IF statement is true.

- 8 These cards describe the detail print line. Note the fourth parameter of the first card (21G2) causes group indication on the report format shown for the example. The literals "-" are required to insert the dashes shown in the example format.
- 9 This line defines the minor total print line format. It is associated with the control break because cc4 has the number 1 which corresponds to the break level in the CTL card.
- 10 This line defines the final total print line. Since only the carriage control is different from the minor total line, the shorthand method of defining print lines was used (Figure 4-26).

#### 4.2.4.3.3 Example 3:

Using a two-level hierarchical sequential file, select detail records based on a value in its heading record and on values of two fields in the detail record itself. Only five words of data are needed to be passed to the sort and report phases. The report involves maintaining a running total of four values and another total derived from these. There are two break levels and final totals. A literal value is to be substituted on the report using the table lookup feature.

#### REPORT FORMAT. (file code PA)

```

xxxxxxx      LLLLLLLLLL   yyy   aaaa   bbbb   cccc   dddd   eeee
SUBTOTAL FOR OPERATION CODE yyy aaaa   bbbb   cccc   dddd   eeee
TOTAL FOR    LLLLLLLLLL           aaaa   bbbb   cccc   dddd   eeee
C.G totals  * * * * *           aaaa   bbbb   cccc   dddd   eeee

```

where: xxxxxx	is from positions 1-7 of the input record.
LLLLLLLLLL	is literal from table lookup function.
yyy	is from positions 24-26 of input record.
aaaa	contents of counter 1 at current level.
bbbb	contents of counter 2 at current level.
cccc	contents of counter 3 at current level.
dddd	contents of counter 4 at current level.
eeee	contents of counter 5 at current level.

CONTROL CARDS.Footnote

DTL	(8 = "4951" OR "4052") AND	1
DTL	(126 = "799" OR "759" OR "921" OR "993")	1
HOLDA	1 = "XXXXXX" AND 7 = "XXXXX"	2
WRIT1	HA16 = "7402"	3
RCD1WS	L5,1/11, 54/12, 126/3	4
* SORT THE RECORDS CREATED ABOVE		
SORT	8,4,A, 24,3,A 1,7,A	5
SIZES	5,5	5
*PRINT THE REPORT		
HEADA	CCT0, 50S, "MEDICAL SYSTEM"	6
HEADB	CC23,"REGISTER NUMBER FACILITY OPERATION"	7
HEADB	6S,"DAYS BED DAYS THIS FACILITY BED DAYS"	7
HEADB	4S,"POST OP DAYS",12S,"TOTAL DAYS"	7
CTL	B1 = 24/3, B2 = 8/4	8
CNTRS	C1 = 12\$3, C2 = 15\$3, C3 = 18\$3, C4 = 21\$3	9
COMPUT	C5 = C1 + C2 + C3 + C4	10
TABL01	8,"4951" = "HILL AFB", "4052" = "TINKER AFB"	11
* DEFINE DETAIL PRINT LINE		
PRT01	CC01,4S,1/7,9S,T01/10,5S,24/3,8S,C1A/4,11S,C2A/4	12
PRT01	15S,C3A/4,9S,C4A/4,16S,C5A/4	12
* DEFINE BREAK LEVEL 1 PRINT LINE		
PRT12	CC12,"SUBTOTAL FOR OPERATION CODE ",24/3,15S	13
PRT12	C1A/4,11S,C2A/4,15S,C3A/4,9S,C4A/4,16S,C5A/4	13
* DEFINE BREAK LEVEL 2 PRINT LINE		
PRT23	CC2T,"TOTAL FOR ",T01/10,26S	14
PRT23	C1A/4,11S,C2A/4,15S,C3A/4,9S,C4A/4,16S,C5A/4	14
* DEFINE FINAL TOTAL PRINT LINE		
PRTF4	CC5T,"TOTALS * * * ",34S	15
PRTF4	C1A/4,11S,C2A/4,15S,C3A/4,9S,C4A/4,16S,C5A/4	15

Footnotes:

- 1 This card controls selection of input records from file code 11.
- 2 This card controls holding of the first 120 characters of any record that contains blanks in positions 1-11. The heading record for each group of detail records has been defined on this file as being blank in these positions. The logic statement had to be coded as shown since literals cannot exceed six characters.
- 3 The WRIT card is associated with the RCD card. Only records with positions 16-19 of HOLDA equal to "7402" will be written on file code WS.

- 4 This card describes the record format to be written on file code WS (cc 5-6). The records will be five words in length and will contain positions 1-11, 54-65 and 126-128 of the detail record. File code WS was used since the data is to be input to Phase II.
- 5 The SORT and SIZES cards are similar to examples 1 and 2.
- 6-7 These cards provide column headings for the output report.
- 8 This card establishes minor control break on positions 24-26 and major control break on positions 8-11 of the input records.
- 9 This card places the BCD values (\$ conversion type) of positions 12-14, 15-17, 18-20 and 21-23 into counters C1 through C4, respectively.
- 10 This card adds the values in C1 through C4 and places the sum in C5.
- 11 This card establishes values to be searched for in positions 8-11 of the input records. If the value "4951" is found, the literal "HILL AFB" will be printed; while "TINKER AFB" will be printed if the value "4052" is found.
- 12 These cards define print format for detail lines (cc 4 = 0). Note the entry T01/10 is the location where substitution, of a value within the current record, for a value in the lookup table is performed.
- 13 These cards define the format for minor total breaks.
- 14 These cards define the format for major control breaks.
- 15 These cards define the format for the final total line.

- 4.2.4.4 Program Switch Word Bit Usage. SIS uses certain bits of the PSW to pass information between the programs. The original contents of the PSW are saved, except bit 21 noted below, and is restored by the last phase executed. The user may use a \$ SET JCL statement to set and reset these bits, or use the OPTION control card (paragraph 4.2.2.5), as necessary to activate options.
- \* Bit 21 is always reset if no syntax errors are found and is set if errors are found. The SIS edit program prints a warning message on the control card listing if the DUMP option is omitted
  - \* from the \$ PROGRAM card and it is not included on the OPTION card.

<u>BIT</u>	<u>USAGE</u>
------------	--------------

- |      |  |
|------|--|
| 18   | Set by EDIT if Phase I is to execute.  |
| 19   | Set by EDIT if Phase II is to execute.   |
| 20   | Set by EDIT if Phase III is to execute.  |
| * 21 | Set by EDIT if syntax errors are found and reset if no errors are found. Bits 0-20 and 22-35 are unchanged.  |
| * 22 | Set by user to indicate the use of spaces instead of zeroes for filler fields in RCD statements.   |
| 23   | Set by user to indicate only one WRIT statement is to be considered true for each Phase I detail input record.   |
| 26   | ISP suppresses file utilization report, if on.   |
| 27   | Set by user to suppress printing of the SIS control cards.   |
| * 28 | Ignored if not at AFDSDC. Used during testing.   |
| * 29 | Ignored if not at AFDSDC. Used during testing.   |
| * 30 | Used to indicate the file codes I1, WS-WZ and I3 are not compacted, even though it (they) may appear to be. This may be necessary if the first word of the first record on a file is negative.                           |
| * 31 | Used to indicate that variable data from file code I3, HDREC, HOLD and TABL areas are to be suppressed in heading lines when final totals are being printed. This was the default prior to the July, 1979 block release. |



4.2.5 Key punch Instructions. The responsibility for key punch and verification will be determined by each user and DPI in accordance with local procedures.

4.3 Output Requirements. The purpose, time, mode, medium, and location of any output is at the discretion of each user, depending upon the requirements and local application of SIS. AFM 171-100 standards should be referenced to insure compliance.

4.3.1 Output Formats. The format of any and all output information is entirely at the discretion of the user, qualified only by the standards in AFM 171-100.

4.3.2 Sample Outputs. Reference paragraph 4.2.4.3, coding examples.

4.3.3 Output Vocabulary. Legal character combinations or codes to identify or compose output items are dependent on each user's choice of files or data bases to be used in conjunction with SIS.

4.4 Utilization of System Outputs. The use of all outputs is entirely at the discretion of each user, except as restricted by AFM 171-100 or other applicable directives.

4.5 Recovery and Error Correction Procedures. Recovery and loading procedures for SIS are detailed in AFM 171-714, Vol I.

4.5.1 Error Messages. When any syntax errors are found during control card editing, numbered messages are printed following the card(s) in error. When the error number is formatted "nn(cc)", the "nn" is the error number listed below, and the "cc" is the column number just past the field found in error (e.g., if prefix M were used in Phase III in column 12 as follows: M23/5, the "cc" would be 15.) If the "cc" value is "79" the error is in the last field on the card. A more detailed explanation of each error follows.

#### 01 SYNTAX ERROR

A syntax error was detected. One of the following messages usually follows; however, if no message follows, the contents of a portion of cc 7-78 are not recognizable.

LITERAL LENGTH OF ZERO

Two consecutive quotation marks were found.

NON-NUMERIC VALUE

Non-numeric data was found where numerics are required.

MAX OF 18 CHARS FROM TABL

Output from a TABL may not exceed 18 characters.

LITERAL OVER 6 CHARACTERS	A literal cannot exceed one word, but can be split into multiple literals.
ILLEGAL FIELD AFTER = OR -	Depending on the control card, several errors may cause this message. Read the documentation on the specific card.
( NOT AFTER AND OR OR	Parentheses can only be used in logic statements to group data for AND or OR conditions.
* ILLEGAL USE OF )	An extraneous right parenthesis was found.
* HALF OF TO MISSING	A range of values was implied, but the second value was not found.
= OR - MISSING IN A CONDITION	Self-explanatory.
NO FIELD POSITION FOUND	In a logic statement, an = or - was found before a field position was specified.
ILLEGAL FIELD FOUND	Field position specified is too large.
A TO B TO C FOUND	Only two values may be specified in a TO range.
* UNEQUAL LITERAL LENGTHS	All literals and/or # delimited fields to be compared against a field position must be the same length in the same condition on a logic statement. If different lengths are needed, the field position may be repeated.
* ILLEGAL LOGICAL CONNECTOR	Two consecutive literals were found or the end of a condition was not followed by a period, the word AND or the word OR.

UNEQUAL LEFT AND RIGHT PARENS	Self-explanatory.
LOGIC STATEMENT > 21 CARDS	Self-explanatory.
VARIABLE DATA PRIOR TO CC 7	CC 4-6, cc 5-6 or cc 6 must be blank for the control card indicated.
INVALID PREFIX REFERENCE USED	The logic statement contains a prefix reference not valid at this point (e.g., IA in a SELECT card).
OVER 50 PARAMS	A maximum of 50 parameters may be used in one execution.
END OF CARD SYNTAX	A PARAM card does not have a blank in cc 78.
PARAM(S) TOO LONG	After substitution of parameter value(s), the control card exceeds cc 78. Move a portion of the data to another card.
NO MATCHING PARAM	Reference was made to a parameter number that was not defined in a PARAM card.
PARAM < 01 OR > 50	A parameter number is zero, greater than 50 or is not two digits following the percent sign.
PARAM LENGTH ZERO	A PARAM card ends with a comma or two successive commas were found.
02 MATCH CARD MISSING	If match cards are used, there must be a <u>MATCHD</u> and <u>MATCHM</u> card.
03 MISSING PARAMETER ON ISP	All keyword parameters are required on the ISP control card.
04 ILLEGAL HOLD CARD	Either cc 5 is not A, B, or C; or, HOLD cards are not in sequence on cc 5.

- |    |                               |   |
|----|-------------------------------|---|
| 05 | IF CARDS NOT IN SEQUENCE      | The IF statements must be in ascending sequence on cc 3-4.  |
| 06 | IF NUMBER NOT 2 CHARS         | IF numbers must be two numeric characters in cc 3-4.  |
| 07 | NO C BEFORE = ON CNTRS        | The letter C must precede the counter number being referenced by the operation(s) following the equal sign.                 |
| 08 | = MISSING ON CNTRS            | No equal sign was found on CNTRS card. Possible keypunch error.   |
| 09 | INCOMPLETE IF ON CNTRS        | Possible user error in that CNTRS cards may not be continued  |
| 10 | SYNTAX ERR AFTER IF ON CNTRS  | Data following IF is not numeric.   |
| 11 | NO IF NUMBER MATCH ON CNTRS   | Data following IF on a CNTRS card does not match any preceding IF statement number.   |
| 12 | NO \$, /, OR X IN CNTR FIELD  | No indication is given as to the type of data being referenced.   |
| 13 | SYNTAX ERR AFTER X ON CNTRS   | Nothing can follow X except an IF number, spaces or another counter reference.  |
| 14 | ILLEGAL COUNTER OUTPUT FORMAT | Either an unknown edit pattern was specified or the one used is illogical (e.g., specifying binary output to a print line). |
| 15 | INCOMPLETE CTR SPECIFICATION  | End of card was reached or no length was found following a \$ or /.   |

- |    |                                  |   |
|----|----------------------------------|---|
| 16 | ILLEGAL CTR NUMBER               | Counter number of zero was obtained during card scan. Possibly the letter C is not followed by numeric counter number.  |
| 17 | NO = FOUND ON COMPUT             | Entire card was scanned without finding an equal sign. Possible keypunch error or illegal continuation usage.   |
| 18 | NOTHING AFTER = ON COMPUT        | No data was found following the equal sign. COMPUT cards cannot be continued.   |
| 19 | NOTHING AFTER / OR * ON COMPUT   | Keypunch error or improperly trying to continue a COMPUT card.  |
| *  | 20 LITERAL OVER 999999 ON COMPUT | No literal value may exceed 999999 on a COMPUT card. Possibly line numbers were not stripped if a SIS job was created under CARDIN.   |
| *  | 21 NO C BEFORE = ON COMPUT       | No counter number was specified before equal sign.  |
| 22 | WRIT CARDS NOT IN SEQUENCE       | WRIT cards must be in scientific collating sequence on column 5.  |
| *  | 23 BAD RECORD LENGTH ON RCD CARD | The "L" option was used, but the value specified is zero or greater than 256.   |
| 24 | ILLEGAL LABL CARD -- IGNORED     | CC 5-6 do not specify a proper file code. The card is ignored and will not cause an abort if no other errors are found.<br>NOTE: In TRS these cards are syntax checked but have no meaning unless RUNB is used. |

- |      |                                |  |
|------|--------------------------------|--|
| 25   | SORT PARAMETER MISSING         | There were not three parameters entered for each field to be sorted.   |
| 26   | SIZES CARD MISSING<br>(or)     | A SIZES card is required if the SORT card is used; or, the second parameter is greater than 256.   |
| 26   | MAX RECORD SIZE IS 256 WORDS   |  |
| * 27 | P1 > P2 IN LINES CARD          | The physical page size (P2) must be at least three greater than the logical page size (P1). If P1 is greater than 63, the default for P2 must be overridden. |
| 28   | SYNTAX ERROR IN FOOT CARD      | Either cc 5 does not contain a space, an N or an S; and/or cc 6 is not blank.  |
| 29   | CTR NOT ALLOWED IN HEAD CARD   | Self-explanatory.  |
| 30   | NO B BEFORE = ON CTL           | The letter B must precede the break level number(s).   |
| 31   | CTL GREATER THAN 9 FOUND       | A maximum of nine control breaks can be specified. Possible keypunch error if a non-numeric character follows the letter B.                                  |
| 32   | BAD CTL LEVEL                  | Control level number is not 0-9 or the letter F.   |
| 33   | NO FIELD LOCN ON 1ST TABL CARD | The first parameter on the first card for each table must contain the location of the data to be converted.  |
| * 34 | HALF OF TABL ENTRY MISSING     | A table entry pair must be completed on the same card.   |
| 35   | ILLEGAL SOURCE ON TABL         | First table card does not specify an allowable source field for data to be converted.  |

- |    |                              |  |
|----|------------------------------|--|
| 36 | T (TABL #) > 50              | A maximum of 50 tables are allowed in any execution of SIS or TRS.   |
| 37 | UNDEFINED PRINT LINE         | A PRT card has attempted to redefine a nonexistent print line.   |
| 38 | END OF CARD DURING LITERAL   | A literal value cannot be continued and/or must be completed in cc 78 or earlier including the quotation mark.   |
| 39 | ARGUMENT OVER SIX CHARACTERS | First value of a pair in a TABL card cannot be greater than six characters.  |
| 40 | UNEQUAL ARGUMENT LENGTHS     | First value of a pair in a TABL card is not the same length as the first value found for this table.   |
| 41 | LITERAL OVER 18 CHARACTERS   | Second value of a pair in a TABL card cannot exceed 18 characters.   |
| *  | 42 INCOMPLETE FIELD          | If the last field on the card in error contains a slash, G or Z delimiter, column 78 must be blank or contain a comma; or, imbedded blanks were found in an illegal position; or, end of card was reached before a pair of entries was complete on TAB |
| 43 | SECOND QUOTE MISSING         | A literal value on a RCD, HEAD or PRT card was not terminated by a quotation mark.   |
| 44 | ILLEGAL PARAMETER USED       | On an ISP card, an unknown parameter was used.   |
| 45 | UNKNOWN REFERENCE USED       | An illegal record area prefix was used.  |
| 46 | V-LABEL IN ERROR             | Value specified exceeds 12 characters.   |
| 47 | SEQ ERROR WITHIN CD TYPE     | Self-explanatory.  |

- 48 CARDS NOT IN SEQUENCE  
Control cards must be in the sequence shown in paragraph 4.2.2.5.
- 49 ILLEGAL CARD -- NOT EDITED  
The indicated card is unknown to SIS or TRS.
- 50 TOO MANY COUNTERS USED  
The number of counters used times the number of control breaks exceeds 561. See CNTRS control card documentation for counter assignment hints.
- 51 COUNTER OUTPUT TOO LARGE  
The number of positions specified for a counter output is larger than allowed. See PRT control card description for maximum permissible sizes.
- 52 TOO MANY RCD FILE CODES  
In SIS, Phase I RCD cards specify more than eight file codes.  
  
In TRS, there is a maximum of nine file codes in the allocation table. Phase I has specified eight RCD cards and a master file. There is not room for file code FA (RCD cards in Phase III).
- 53 SYNTAX ERROR IN USE COUNT  
CC 8-11 are not numeric and/or cc 12 is not a blank or comma.
- 54 FILE(S) WS-WZ NOT PRESENT  
SORT was requested, but no input file(s) were found in the job stream. This message applies only to SIS.
- 55 FILE CODE \*\* IS NOT PRESENT  
Based on control cards supplied, the file code, which replaces the asterisks, is required for proper execution; but, no JCL is present in the job stream for the file. (This message will appear for each file code not present in SIS executions only.)



- |                                  |  |
|----------------------------------|--|
| 56 NO RCD CARD(S) FOR PHASE I    | At least one RCD card is required when Phase I is executed.  |
| 57 NO LABEL FOR FILE CODE FA     | No "V" option was used for the file label in RCD cards or no LABLFA directive is present.  |
| 58 SYNTAX ERROR IN SAMPLE OPTION | CC 7 must be the letter S and cc 12 must contain a slash. CC 8-11 and 13-17 must be numeric. CC 18 must be blank or a comma.             |
| 59 MAX OF 20 SORT KEYS EXCEEDED  | A maximum of 20 sort fields may be specified for sort keys.  |
| 60 SORT PARAMS EXCEED 200 CHARS  | Up to 20 fields may be specified, but there may not be over 200 characters used in defining them.  |
| 61 NO MATCHING CTL LEVEL         | A PRT or RCD card in Phase III specifies a break level for which no corresponding CTL break level was established.                       |
| 62 OPTION NOT VALID IN PHASE I   | An option has been coded on an RCD card in Phase I that is only valid in Phase III, such as the table look-up feature or page insertion. |
| 63 ILLEGAL VALUE ON CNTRS        | Unrecognizable data has been encountered on a CNTRS card.  |
| 64 ILLEGAL PLACEMENT OF REDEF    | If a print line is to redefine a previous one, the parameter must be coded first or following the CC option.                             |
| 65 NO PRT CARD FOR CTL LEVEL     | Every control break level must have at least one PRT or RCD card.  |

- |      |                                   |   |
|------|-----------------------------------|---|
| 66   | GAP IN CTL LEVELS                 | Level numbers were skipped in the CTL card (e.g., B1, B3).  |
| 67   | SAMPLE VALID IN DTL ONLY          | Self-explanatory.   |
| 68   | QUIT MUST HAVE LOGIC STMT         | Quit option syntax is invalid.  |
| 69   | NO LENGTH IN RCD CARD             | Self-explanatory.   |
| 70   | INVALID SORT SEQUENCE TYPE        | Value was not "A" or "D".   |
| 71   | SORT KEY EXCEEDS SIZES<br>VALUE   | A sort key was found that is not within the size of the records to be written by the sort phase.  |
| 72   | NO PRT/RCD FOR PHASE III          | Phase III control cards are present but no PRT or RCD card was found. This message also appears if HEAD, CLASS and/or FOOT cards are present without and PRT card(s). |
| 73   | TABLnn REFERENCED, NOT<br>DEFINED | Reference(s) to table "nn" were found in HEAD, PRT and/or RCD cards.  |
| 74   | HOLD/HDREC AREA SIZE<br>EXCEEDED  | Self-explanatory.   |
| 75   | HDR MISSING OR INVALID            | Syntax error using HDR card(s).   |
| 76   | EXTRANEIOUS HDR CARD              | Illegal use of second HDR card.   |
| 77   | OVER 256 LITERALS ON COMPUT       | Self-explanatory.   |
| * 78 | FILE CODE xx MISSING/ILLEGAL      | Based on the retrieval control cards, the file code is required but is not present in the job stream; or, a CONCAT card specified a SIS file code.                    |
| * 79 | ILLEGAL WITH CONCAT CARD          | The control card is not allowed with a CONCAT card present.   |

4.5.2 User Abort Codes:

<u>CODE</u>	<u>MEANING</u>
CC	File code CC is not present.
DI	ISP error on DTL file. (file code I1)
MI	ISP error on MST file. (file code I2)
NF	User requested abort for not-found condition on an ISP file. The file code and key are printed on SYSOUT.
UM	User specified abort for non-matched master records. Specified on the ISPDTL card.
BP	Page bottom count is in error in Phase III. Possible conflict with parameters on LINES card and WWMCCS security caveats.
Mx	An input file is out of sequence in the SIS Phase II MERGE function. The "x" is replaced by the last letter of the file code; e.g., an abort of "MY" would indicate that file code "WY" is out of sequence. If the user is sure the file is in sequence, it may be a compacted file that is mixed in with system standard files; i.e., only the first file opened is checked for being compacted. The DUMP bit in the PSW is reset prior to issuing this type of abort to prevent a full core dump.
MC	The user attempted to read compacted files into the SIS Phase II MERGE function. Only system standard files may be used with this function. The DUMP bit in the PSW is reset prior to issuing this abort to prevent a full core dump.
A1	User requested abort if syntax errors were found on file code CC. This is activated by the SYNABT option on the OPTION card (paragraph 4.2.2.5.1), and may be used in lieu of checking bit 21 of the PSW for syntax errors if the user desires the jobstream to be flushed by the operating system.
CF	User requested syntax check only via the CHECK option on the OPTION card and errors were found. This abort will override the "A1" abort if the SYNABT option is also present on the OPTION card.
DE	An error was found in encoded control cards. If this abort occurs, contact the originator of the retrieval at AFSDC.

TABLE 4-02

## DETERMINING CONTROL CARDS AND FILE CODES

R U L E	IF	THEN THIS CONTROL CARD IS REQUIRED	AND THIS FILE CODE MUST BE PRESENT
1	the "detail" file has a heading record	HDREC	I1
2	specific records are to be selected from the "detail" file	DTL	I1
3	a record count limit is supplied to Phase I	DTL	I1
4	"detail" file records are to be sampled	DTL	I1
5	a range of records are to be read from the "detail" file and then EOF is to be forced	DTL	I1
6	specific records are to be selected from the "master" file	MST and MATCH	I1 and I2
7	"master" and "detail" records are to be matched	MATCH	I1 and I2
8	the "detail" file is ISP format	ISPDTL	I1 and Z1
9	the "master" file is ISP format	ISPMST	I2 and Z2
10	auxiliary ISP files are used	ISPA, ISPB, ISPC, ISPD and/or ISPE	IA/ZA, IB/ZB, IC/ZC, ID/ZD, and/or IE/ZE
11	"detail" record(s) are to be held for later references	HOLDA, HOLDB and/or HOLDC	I1
12	conditions are to be specified for placing values into counters	IF	I1

TABLE 4-02 (continued)

R U L E	IF	THEN THIS CONTROL CARD IS REQUIRED	AND THIS FILE CODE MUST BE PRESENT
13	values are to be placed into counters	CNTRS	I1
14	calculations are to be performed	COMPUT	I1
15	records are to be written on a conditional basis	WRIT	I1
16	record formats are speci- fied for output file(s)	RCD	File codes named in cc 5-6 of RCD
17	file labels are specified for output files from Phase I	RCD	Same as rule 16
18	file label is specified for Phase II output file	LABLI3	I3
19	file label is specified for Phase III output file	LABLFA	FA
20	records are to be sorted	SORT and SIZES	I3 and WS,WT,WU WV,WX,WY and/or WZ
21	specific records are to be sorted	SORT, SIZES and SELECT	Same as rule 20
22	a record count limit is supplied to Phase II	Same as rule 21	Same as rule 20
23	a range of records are to be sorted	Same as rule 21	Same as rule 20
24	specific records are to be input to Phase III	SELECT	I3
25	a range of records are to be input to Phase III	SELECT	I3
26	a record count limit is supplied to Phase III	SELECT	I3

TABLE 4-02 (continued)

R U L E	IF	THEN THIS CONTROL CARD IS REQUIRED	AND THIS FILE CODE MUST BE PRESENT
27	sort input file(s) have heading records	SORT, SIZES, and HDREC	Same as rule 20
28	the Phase III input file has a heading record	HDREC	I3
29	the number of lines on a print page is to be changed	LINES	I3 and PA
30	page classification is to be specified	CLASS.	I3 and PA
31	page footing for PCN is specified	FOOT	I3 and PA
32	page headings are to be on report	HEAD	I3 and PA
33	Phase III input record(s) are to be held	HOLD	I3
34	control breaks are to be executed	CTL	I3
35	conditions are to be speci- fied for placing value into counters	IF	I3
36	values are to be placed into counters	CNTRS	I3
37	calculations are to be performed	COMPUT	I3
38	literal values are to be substituted for codes	TABL	I3
39	a printed report is to be generated	PRT	I3 and PA
40	a sequential file is to be written, in SIS only	RCD	I3 and FA

TABLE 4-02 (continued)

R U L E	IF	THEN THIS CONTROL CARD IS REQUIRED	AND THIS FILE CODE MUST BE PRESENT
41	options are specified to direct SIS processing	OPTION	
42	variable parameters are to be substituted	PARAM	

10111111  
11111111  
11111111

1

2

3

4



HDREC Control Card

This optional control card indicates that the first record on the Detail (file code 11) File is not a data record but rather a Header record that contains data that will be referenced throughout the PHASE. The first 120 characters, or the entire record if shorter than 120 characters, are saved and are available for reference using the prefix letter H when referring to the data.

In addition, the HEADER record is written as the first record of each output file as a 20-word record or the original record size, whichever is smaller.

The HDREC record is included in the count of detail records read, but not in the count of detail records selected if a DTL card is included.

In TRS, this control statement is generated if the question "HEADER RECORD ON DETAIL FILE? (YES or NO)" is answered YES when the ASSIST command is used.

- \* The capabilities of the HDREC control card have been expanded; all "old" format cards will work exactly as before. The new options are invoked by a special format HDR card, as follows:

CC CONTENTS

- 1-4 Constant value of "HDRP".
- 5 Phase number to which the option in cc 6 applies.
- 6 Option character, which must be one of the following:
  - Ø This format will be treated the same as if "HDRECØ" had been entered. In Phase III of SIS, it may be coded "HDRP3ØFA" if the heading record is to be written on file FA and RCD cards are present.
  - S (Strip) The input file contains a heading record which is to be read and placed into the HDREC area, but no heading record is written on any output(s) from the phase.
  - R (Replace) The input file contains a heading record which is to be skipped and the contents of the two cards containing the "R" option will be placed into the HDREC area and will be written on output(s).

Figure 4-01. HDREC Control Card.



- O (Override) The input file contains a heading record which is to be read and written to output(s). The contents of the two cards containing the "O" option are placed in the HDREC area during the execution of the retrieval.
- N The input file does not contain a heading record and the contents of the two cards containing the "N" option are placed in the HDREC area during execution. No heading record is written.
- Y The input file does not contain a heading record and the contents of the two cards containing the "Y" option are placed in the HDREC area and written to output(s).

NOTE: These options apply to all phases of SIS, and all except Phase III of TRS. For options "R", "O", "N" and "Y", two cards must be present. The contents of cc 7-66 of the first card become positions 1-60 of the HDREC area. The contents of cc 7-66 of the second card become positions 61-120 of the HDREC area. The following algorithms may be used to determine actual HDREC starting position for a field. If the field starts on the first HDR card, subtract 6 from the starting column number. If the field starts on the second card, add 54 to the starting column number.

EXAMPLE:

HDRP10THIS VALUE WILL BE USED AS THE CONTENTS OF HDREC AREA DURING HDRP10 PHASE I, BUT THE ACTUAL HDREC FROM "I1" IS WRITTEN TO O/PS.  
 .  
 .  
 RCDxWS . . . .  
 SORT . . .  
 SIZES . . .  
 HDRP2S (directs Phase II to "strip" heading records from WS-WZ)  
 HDRP3NUSE THIS VALUE DURING PHASE III FOR REFERENCES TO THE HEADIN  
 HDRP3NG RECORD AREA

Where an option does not apply, such as "HDRP2N", it will be ignored. If any Phase II options are used which cause the HDREC to be written on file code "I3" and there are no "HDRP3x" cards present, Phase III will execute as if "HDRP3Ø" had been entered. No attempts are made to edit the "logic" of the combinations used. If a heading record is written with the "Y" option, it will be 20 words in length. The heading written by the "R" option will be 20 words or the size of the record it is replacing, whichever is ~~smaller~~. If the "R" option is used in Phase II, the output HDREC size is determined by the HDREC on the last file read.

Figure 4-01. HDREC Control Card. (cont'd)

The following chart depicts the input and output sources of heading records by option. All requirements for each input file in Phase II are the same as with "HDRECØ"; i.e., every file (WS-WZ) is assumed to have a heading record if any "HDRP2x" card(s), except "HDRP2N" and "HDRP2Y", are present. (The letter "n" represents the phase number.)

OPTION USED	# CARDS REQ'D	HDREC ON INPUT	WRITE ON OUTPUT	HDREC IN CARDS	WRITE ON OUTPUT
HDRECØ	1	YES *	YES	NO	-
HDRPnØ	1	YES *	YES	NO	-
HDRPnS **	1	YES *	NO	NO	-
HDRPnR	2	YES	NO	YES *	YES
HDRPnO ***	2	YES	YES	YES *	NO
HDRPnN **	2	NO	-	YES *	NO
HDRPnY	2	NO	-	YES *	YES

\* The HDREC area will contain data from this source during execution of the retrieval.

\*\* If used in Phase II, and no "HDRP3x" card(s) follow, Phase III will execute as if no HDR card(s) are present.

\*\*\* If used in Phase II, will be treated as "HDRP2Ø" since there is no HDREC area in Phase II.

NOTE: If applicable, any form of "HDRP3x" may be used as the first control card, following OPTION and/or PARAM(s), to force only Phase III to execute. The ASSIST routine in TRS was not changed to allow these options to be specified. The CARDIN subsystem may be used to change or add the HDR card(s) required.

Figure 4-01. HDREC Control Card. (cont'd)

DTL Control Card

The control card contains an optional field for limiting the number of input records to be used and/or a logic statement which will be used to determine if the record is a candidate for further processing. If all records from file code 11 are to be used as input, this card is omitted. If it is included, records that do not match the selection criteria are bypassed.

ALLOWABLE PREFIX REFERENCES. H, M, DCARD FORMAT

cc 1-6 cc 7-78

DTL~~xxx~~ logic statement

ASSIST positions the terminal to enter data starting in cc 7.

EXAMPLE 1:

DTL 1 = "A"

Only record with an "A" in position 1 will be selected from file code 11.

EXAMPLE 2:

DTL U0175, 6 = "ABC"

The "U0175," indicates that only the first 175 records from file code 11 are to be read. This option must be coded with the letter U in cc 7, a numeric value in cc 8-11, and a comma in cc 12, when used with additional logic statement as shown above. If cc 12 is blank, it is assumed there is no logic statement following. In the example, only records that contain "ABC" in positions 6-8 will be processed and only the first 175 records will be checked for the presence of these characters.

Figure 4-02. DTL Control Card.

EXAMPLE 3:

DTL     Sxxxx/yyyy

This option is used to sample the records being read from file code 11. The letter S must be in cc 7 and cc 12 must contain a slash. Columns 8-11 are the number of records to skip and cc 13-17 are the number of records to process. Column 18 is a comma if a logic statement follows or a blank for only sampling. The first record on file code 11 is always used (e.g., if S0010/00002 were coded, SIS or TRS would use the first two records, skip ten records, use two records, skip ten records, etc.). In addition, if a logic statement is included, only those records being used are considered for meeting the criteria. This option is available on the DTL card only.

EXAMPLE 4:

DTL     QUIT , 67 = "D" TO "M"

The "QUIT ," specifies that the file is sequenced by the field in the logic statement and EOF is to be initiated as soon as the first false condition occurs after a true condition has occurred. The "QUIT ," must be in cc 7-12 and cc 11 must be blank. In this example, records with A, B, or C in position 67 will be bypassed. Records with D through M will be selected. EOF will be initiated as soon as an N through Z is read.

Figure 4-02. DTL Control Card. (cont'd)

MST Control Card

This optional control card is used to provide selection criteria for records read from file code I2. The action taken based on the criteria is identical to the DTL card. If all records from file code I2 are to be used as input, this card may be omitted. However, file code I2 is not used at all by the program unless MATCH control cards are present.

ALLOWABLE PREFIX REFERENCES. H, M, DCARD FORMAT:

cc 1-6 cc 7-78

MST~~xxx~~ logic statement

ASSIST positions the terminal to enter data starting in cc 7.

EXAMPLE:

MST M76 = "DU"

Only records with positions 76-77 of the MST file equal to "DU" will be selected from the MST file. This selection is done prior to the matching specified on the MATCH control cards (i.e., if a record does not meet this selection criteria, it is not used to MATCH against the current DTL record). Note that the "M" prefix must be used when referencing the MST record.

Figure 4-03. MST Control Card.

MATCH Control Card

These control cards contain fields in the MST and DTL records upon which a match is to be obtained. Except in the case of ISPMST random specification (see ISP Control Card), both the MST and DTL files must be in ascending sequence by the field(s) specified. There must be a MATCHD card for the DTL file and a MATCHM card for the MST file if this option is used. Note the MST file is not opened unless MATCH cards are present in the control card file.

ALLOWABLE PREFIX REFERENCES. H, HA, HB, HC

CARD FORMAT:

cc 1-6 cc 7-78

MATCHD field specification(s), separated by commas, options  
MATCHM field specification(s), separated by commas.

ASSIST positions the terminal to start entering data in cc 7.

EXAMPLE:

MATCHD 7/8, 23/6, 18/1, H5/4  
MATCHM 3/8, 44/6, 43/1, 12/4

- \* Match DTL record positions 7-14, 23-28, 18 and HDREC positions 5-8 with MST record positions 3-10, 44-49, 43 and 12-15. Note that the number of field descriptions and field lengths must correspond in both cards. If no further options are specified, the files are assumed to be in scientific collating sequence on the match keys and if no master record is found for a DTL record, an MST record of all blanks is generated internally to satisfy the match. Five options may be added to the MATCHD card as follows to override the default logic:

- A Specifies that the program should abort if no matching master record is found for a detail.
- D Specifies that an unmatched detail record be bypassed.
- E Use every record from MST file that matches DTL file, not one for one. Must be on MATCHD card and is mutually exclusive with "R" on ISPMST. If no matching record on the MST file, the DTL record is bypassed.

Figure 4-04. MATCH Control Card.

- S Specifies that both files are in scientific (Honeywell standard) collating sequence. This option must be used if the field(s) contain mixed alphabetic and numeric data and the file is in Honeywell standard sequence. This is the default, effective with the March 1978 block release.
- C Specifies that both files are in commercial collating sequence. This option must be coded if the files are in commercial sequence since it is no longer the default.

MATCHD 7/8, 23/6, 18/1, D, C  
MATCHM 7/8, 23/6, 18/1

Match files in commercial sequence in positions 7-14, 23-28 and 18. If no MST record is found, bypass the DTL record and get the next DTL record. (See ISP Control Card for exception.)

NOTE: The A and D options are mutually exclusive.

If any selection criteria was specified on a DTL and/or MST control card, this criteria is satisfied before matching is done.

Figure 4-04. MATCH Control Card. (cont'd)

ISP Control Card

The ISP card(s) specify the information necessary to access ISP format files. One such card must be present for each ISP file used. The DTL and/or MST files may be in ISP format and up to five auxiliary input ISP files may be used.

ALLOWABLE PREFIX REFERENCES. HA, HB, HC, M, IA - ID.

CARD FORMAT:

cc 1-6 cc 7-78

ISPDTL KEY=n/m, SIZE=x, OFFSET=y, options

ISPMST

ISPA - ISPE

ASSIST positions the terminal to enter data starting in cc 4.

The parameters shown above are required and have the following meaning:

- KEY=n/m Specifies the position in the source record where the key data is found. The "n" is the field location and "m" is the length. Prefixes may be used to specify that the key is in a higher level area (e.g., on the ISPC card, the key could be located in the areas that contain records from ISPB, ISPA, MST or DTL files).
- SIZE=x Specifies the largest ISP record size in words.
- OFFSET=y Specifies the location of the key field in this file, and is a zero relative number. (e.g., if this file's key is in positions 1-9, code OFFSET=0).
- OPTIONS
- A The job is to be aborted if no record is found on the ISP file for the key.
  - D The record is bypassed if no matching record is found for the key. If coded on an ISPA - ISPE card, it is treated as if it were option "A".
  - R The MST file is to be read randomly instead of the normal sequential mode. This option can only be coded on the ISPMST control card. In this instance, the DTL file does not necessarily need to

Figure 4-05. ISP Control Card.



be in sequence by the field that is the KEY to the MST file. This option implies that if a nonmatch occurs (no MST record exists for the KEY), the DTL record will be bypassed also; this option is mutually exclusive with the E option on the MATCHD card.

EXAMPLE:

ISPB KEY=IA37/12, SIZE=7, OFFSET=6

Specifies that the KEY data for file IB is in positions 37-48 of the IA file. The size of the largest record on file IB is seven words. The key field for file IB is located in positions 7-18, since the OFFSET must be specified as zero relative. Of course, ISPA must have been specified.

EXAMPLE:

ISPMST KEY=6/5, SIZE=9, OFFSET=2, R

The MST file is in ISP format and the data for the key is located in positions 6-10 of the DTL file, since no prefix was specified. The largest record in the MST file is nine words in length, and the key field for the file is in positions 3-7. The master file is to be read randomly and if no record exists on the file for the key, the DTL record is to be bypassed.

If no options are specified, the program generates a record of blanks to be used as an answer in further statements involving this file.

NOTE: The data portion of ISP files must be contained on one pack to be used as input to SIS or TRS.

Figure 4-05. ISP Control Card. (cont'd)

HOLD Control Card

- These control cards specify that certain records from the DTL file are to be held in memory until replaced by another record of the same type. Three areas of 20 words each are available by default; however, the size of the areas may be specified on the OPTION card (paragraph 4.2.2.5.1) in SIS or with the HSZE command in TRS (paragraph 6.2.3.1). These areas are filled with dollar signs initially and will be used if no record has been held in the area referenced by a prefix of HA, HB or HC.

ALLOWABLE PREFIX REFERENCES. H, M, D.CARD FORMAT:

cc 1-6      cc 7-78  
HOLDxy      logic statement

- \*      x      is the area in which the record is to be held; i.e., A, B or C.
- y      is the letter I if this detail record is also to be processed as a DTL record. Normally a record held is not considered to be a DTL record. If this letter is coded in cc 6, the record is held if it meets the logic criteria and is then processed as any other detail record.

A record may satisfy only one HOLD logic statement; that is, if it satisfies the check for HOLDA it is not considered for HOLDB or HOLDC.

ASSIST positions the terminal to enter data starting in cc 5.

EXAMPLE:

HOLDB          3 = "1" OR M3 = "SMITH"

- \*      At any point during Phase I, HOLDB will contain the record from the detail file which most recently contained a "1" in position 3 or that was current when MST record contained "SMITH" in positions 3-7. When the record was held, it was bypassed since cc 6 does not contain the letter I.

Figure 4-06.      HOLD Control Card.

IF Control Card

These control cards specify conditions which are tested when numeric data is entered into Phase I counters (see CNTRS control card). The IF cards must be submitted in sequence by the number punched in cc 3-4. The purpose of the IF card is to set a true or false condition based on a logic statement so that CNTRS can be updated conditionally.

ALLOWABLE PREFIX REFERENCES. H, HA, HB, HC, M, D, IA - IE

CARD FORMAT:

cc 1-6 cc 7-78

IFnn logic statement

nn is a two-digit number from 01 through 99 and must be in sequence by this number. There is a maximum of 99 IF statements in Phase I, but they may be continued on up to 21 card: each.

ASSIST positions the terminal to start entering data in cc 3.

EXAMPLE:

IF01 5 = "3" AND (M38 = "ABC" OR IA13 = "9"  
IF01 OR HA4 = "X").

Condition is true if DTL record position 5 equals "3" AND positions 38-40 of MST record equals "ABC", OR position 13 of record ISPA equals "9" OR position 4 of record in HOLDA equals "X".

Figure 4-07. IF Control Card.

CNTRS Control Card

These cards specify the source of data, from any available record, to be entered into counters for further calculations. There are 100 counters available in Phase I.

ALLOWABLE PREFIX REFERENCES. H, HA, HB, HC, M, D, IA - IE

CARD FORMAT:

cc 1-6 cc 7-78

CNTRS one or more pairs of operators

ASSIST positions the terminal to start entering data in cc 7.

SYNTAX: Each counter number is preceded by the letter "C" and is followed by an equal sign. Following these, one of the four methods of placing values into counters is used, as follows:

- \* \$ Describes the field as BCD in the form pn\$m; where "p" is a prefix reference, as applicable, "n" is the leftmost character position of the field, and "m" is the field length, maximum is 15. Data must be numeric, the letters A-I, which are treated as positive 1-9; a caret or the letters ~~J-R~~, which are treated as negative 0-9. Any other values will cause an ILLEGAL EIS DATA abort.
- C9
- / Describes the field as binary. The form of coding is the same as BCD except the slash is used instead of the dollar-sign. The maximum length for binary type data is 12.
- X Sets the counter to one.
- Y Increments the counter by one. (Valid only in Phase I)

The "IFnn" option may be added to any format above. The IF number must always be two digits.

EXAMPLES:

CNTRS C1 = 5\$6, C2 = XIF01, C3 = IA7/6, C4 = Y

- \* C1 will contain the BCD value from positions 5-10 of the current detail record, since there was no prefix character. C2 will be set to one if the logic statement on the "IF01" card is true; otherwise, it will be zero for each input record. C3 will contain the binary value from positions 7-12 of the current ISPA record. C4 will be incremented by one for each

Figure 4-08. CNTRS Control Card.

input record. All counters except "Y" format are reset to zero after each detail record is processed. The "Y" format counters are never reset unless the CONCAT card is present (paragraph 4.2.2.5.3) and "PRESET" is punched in cc 19-24. If the "Y" format is used in conjunction with an "IF" statement, the counter will only be incremented when that statement is true; otherwise, it will contain the same value until another true condition is met. No spaces are allowed when defining a field starting location, data type, and length (e.g., IA7/6 ).

Figure 4-08. CNTRS Control Card. (cont'd)

COMPUT Control Card

- \* Computations using counters set with CNTRS cards are done with COMPUT cards. They are stated by an algebraic equation. All multiplications and divisions are done first, in order from left to right. Then a sum is accumulated based on + and -'s found. Divides are rounded to the nearest integer. Literal constants must not exceed 999999 and there may not be more than 256 literals per execution. Duplicates are not eliminated. If a larger constant is needed, it can be composed of separate parts, each not exceeding 999999. The value one million may be expressed as 100 \* 10000. Any value except 262144 and 524288 may be used. M, D, and Y, meaning the current Month, Day, and Year, may be used as literals on COMPUT cards and are included in the 256 literal limitation.

ALLOWABLE PREFIX REFERENCES. None

CARD FORMAT:

cc 1-6 cc 7-78

- \* COMPUT C7 = C1 + C2 \* 10 - C3 / C4 - Y

ASSIST positions the terminal to start entering data in cc 7.

This computation would be carried out as follows:

1. Multiply C2 by 10 and save result.
2. Divide C3 by C4 and save result.
3. Accumulate C1 plus result of step 1.
4. Subtract result of step 2.
5. Subtract the current year (i.e., 77, not 1977).
6. Store the result in C7.

The result of any operation will be an integer value, so that if it is desired to find C3 / C4 taken to two decimal places, C3 \* 100 / C4 must be coded. Parentheses may not be used on COMPUT cards. Comput cards may not be continued, but more than one COMPUT may be entered. For example: C5=(C1-C2)/(C3+C4) would be coded:

COMPUT C5 = C3 + C4  
COMPUT C6 = C1 - C2  
COMPUT C5 = C6 / C5

NOTE: The backslash character may be used in place of the slash for divisions to indicate that the quotient is not to be rounded.

Figure 4-09. COMPUT Control Card.

WRIT Control Card

These cards designate the logic conditions under which the output of various record formats, specified in cc 5, are to be written. The format code in cc 5 must agree with a record code in a subsequent RCD card. WRIT cards are only needed if criteria is required before writing certain record formats. If all record formats are to be written, this card is omitted. That is, if the logic statement on WRITx card were true, a record as described by RCDx card(s) will be written. If false, no record is written.

ALLOWABLE PREFIX REFERENCES. H, HA, HB, HC, M, D, IA - IE. The D prefix must be used in the WRIT card to reference the DTL record. The absence of a prefix references the record of the type coded in cc 5, which has just been constructed from parameters in the RCD card.

CARD FORMAT:

cc 1-6      cc 7-78  
WRITf      logic statement

f is the format code.

ASSIST positions the terminal to start entering data in cc 5.

EXAMPLE:

WRITB      25 = "A" OR D25 = "B"

In this example, the record of format B (specified on the RCDBxx card) will be written only if position 25 of record B is "A" or the DTL record is "B" in position 25. .

NOTE: In TRS, all WRIT statements are checked and if true, the corresponding RCD format is written. If it is possible that more than one WRIT can be true and only one output RCD format is desired per input record, issue the "WON" command prior to "RUN" or "RUNT" command. This will cause TRS Phase I to stop checking WRIT logic statements and writing RCD formats after the first one found to be true is executed. This procedure is executed for every input record from the detail file. In the case of "RUNB", if the "WON" command is in effect, an OPTION statement will be generated to pass to the SIS batch programs. In SIS, the user may use a \$ SET 23 JCL card or an OPTION statement (see paragraph 4.2.2.5).

Figure 4-10. WRIT Control Card.

RCD Control Card

- \* The RCD control cards are required and describe the various output record formats desired. The format code is punched in cc 4 and all 64 possible characters may be used (except & if PARAM cards are present), giving up to 64 different formats. A maximum of eight files may be created. If the files are to be passed to Phase II (Sort), they must be created on file codes WS-WZ. If a single file is being created and is being passed to Phase III (Report) without executing Phase II, the file code must be I3. Otherwise, the file code assignment is arbitrary. These cards must be in scientific collating sequence on cc 4.

ALLOWABLE PREFIX REFERENCES: H, HA, HB, HC, M, D, IA - IE.

CARD FORMAT:

cc 1-6 cc 7-12

RCDcff field descriptions (see below)

c is the format code assigned to this record type by the user.

ff is the file code on which the record is to be written.

ASSIST positions the terminal to start entering data in cc 4.

FIELD SPECIFICATION OPTIONS:

- \* L This option has the form Lnn, where "nn" is the number of words desired in the output record. This option must be used in TRS and must be the first option on the first card of each format. A default of 14 words is used by SIS. The maximum size record is 256 words.
- / This option is to describe the source of data fields and has the form pn/m; where, p is a prefix reference, as applicable, n is the leftmost character of the field source, and m is the length of the field.
- \* S This option indicates a filler field and has the form mS, where m is the number of fill positions. NOTE: TRS uses spaces to fill and SIS uses zeroes as the default.
- \* M,D,Y,N These options refer to the two-character month (M), day (D), year (Y), and the three-character name of the month (N). The system date is used and remains constant throughout the execution of Phase I.

Figure 4-11. RCD Control Card.



- CnnD/m or CnnE/m These options specify output from counters. The nn is the counter number and the m is the length of the output field. The letter D is for signed BCD output. The letter E is for signed binary output. C12D/7 is equivalent to COBOL S9(7), and C11E/6 is the same as COBOL S9(6) COMP-1. Note the E type fields will not automatically fall onto word boundaries. The maximum value for m is 12.
- V This option is used to specify an output file label for file(s) created in Phase I. The value must be coded between quotation marks and may be up to 12 characters (e.g., V"OUTPUT-WS"). This option is not used by RUN or RUNT in TRS, but will not cause syntax errors if present.
- Literals Literal values may be specified for insertion by enclosing them in quotation marks ("LIT").
- m(1) This option allows a one-character literal to be propagated through a field. The m is the number of positions to be filled with the character 1. (e.g., to store six asterisks in a field code: 6(\*).)

NOTE: The zero suppression option is not available in Phase I. Reference PRT cards for Phase III.

RCD1WS L8,C1D/5, IA42/8, "RCD1", 4S  
RCD1WS N, C13E/6, 43/2, H3/4, HB1/2

Records created will appear as follows for format 1 on file WS and will be eight words in length:

<u>POSITIONS</u>	<u>CONTENTS</u>
1-5	Signed BCD number from counter 1.
6-13	Field from positions 42-49 of ISPA record.
14-17	Literal of "RCD1".
18-21	Zeros or spaces (depending on bit 22 of PSW).
22-24	The three-character current month (JAN, FEB, etc.).
25-30	Signed binary number from counter 13.
31-32	Field from positions 43-44 of the DTL record.
33-36	Field from positions 3-6 of HDREC.
37-38	Field from positions 1-2 of HOLDB.
39-48	Zeros or spaces (implicitly since record length of eight words was specified).

Figure 4-11. RCD Control Card. (cont'd)

SORT Control Card

This card directs the sorting of input file codes WS through WZ. File code I3 is used to contain the sorted output data.

ALLOWABLE PREFIX REFERENCES. NACARD FORMAT:

cc 1-6 cc 7-78

SORT key field description(s) in major to minor sequence.

ASSIST positions the terminal to start entering data in cc 7.

EXAMPLE:

SORT 36,6,D, 1,15,A

Sort the data on major field in positions 36-41 in descending sequence and minor field in positions 1-15 in ascending sequence. Three entries are required for each field; starting position, length, and the letter A or D for ascending or descending, respectively. A maximum of 20 fields may be specified.

EXAMPLE:

SORTS 16,4,A

The data will be sorted on positions 16-19 in ascending sequence and all but one record with duplicate keys will be eliminated. This feature is only available in SIS (see note below).

For maximum efficiency in TRS, if the same input file is to be sorted and used to produce several reports in the same sequence, assign file code I3 to a PRMFL and use this file as input to subsequent Phase III executions.

NOTE: The squeeze coding option (SORTS) is not supported in TRS with the RUN and RUNT commands; however, RUNB may be used to spawn a batch job if this option is necessary.

Figure 4-12. SORT Control Card.

If up to eight files are in sequence, the SORT or SORTS card(s) may be changed to MERGE or MERGES in a SIS execution only. The merge function is designed to process large volume files and is therefore not supported in TRS. However, MERGE/MERGES card(s) may be present in a RUNB/RUND execution in TRS. All key field descriptions and restrictions pertaining to the sort function also apply to the merge. The following additional restrictions apply to the merge:

a. All files must be in system standard format and scientific collating sequence; i.e., the COM parameter is not permitted on the SIZES card. Compacted files may not be used.

b. If SELECT card(s) are present, only records from each file which meet the criteria will be merged onto file code I3; however, all input files are still sequence checked (see below). If the "QUIT" or "Unnnn" options are used, all files will be closed when the condition is satisfied. In addition, when the "Unnnn" option is used, the actual count of records written to file I3 will be up to seven records less than the limit specified due to records having been read but not being merged before the count was reached.

c. If any form of HDREC, except HDRP2N and HDRP2Y, is present for Phase II, all inputs are assumed to contain a header record. If an input header record is written to file code I3 from an input file, it will be from the file with the highest file code.

If any input file is found to be out of sequence, an "Mx" abort will occur. (reference paragraph 4.5.2) The count of records read from this file indicates the record number that is out of sequence.

EXAMPLE:

```
MERGE 64,12,D, 2,18,A
SIZES ,20
```

Two or more files are to be merged on two fields. The major key is in descending sequence. The merge is to create 20 word records as output on file code I3. If the "MERGE" card had been coded "MERGES", all records with duplicate keys would have been dropped except the one from the highest file code open at the time the duplicate key(s) were found.

\* Figure 4-12. SORT Control Card. (cont'd)

SIZES Control Card

- This card is required if Phase II is executed. The size of the output records is specified as the second parameter. The first parameter is no longer used. If commercial collating sequence (see below) is desired when sorting, COM may be added to the card; otherwise, scientific (Honeywell standard) is assumed. The type of collating sequence becomes important when field(s) contain mixed alphabetic and numeric data. If the sorted file is ever to be used in Phase I, matching on field(s) with mixed data, "SCI" must be used or allowed to default, and the "S" option must be used or allowed to default on the MATCH control cards.

ALLOWABLE PREFIX REFERENCES. NACARD FORMAT:

- \* cc 1-6 cc 7-26  
SIZES ,output size,SCI  
COM (valid with SORT/SORTS only)

ASSIST positions the terminal to start entering data in cc 7.

## EXAMPLE:

SIZES ,14,SCI (no spaces are allowed)

SIZES ,22,COM (not valid with MERGE/MERGES)

All sorted/merged records, with the possible exception of a heading record (figure 4-15), will be the length specified by the second parameter. If the input records are larger, they are truncated. If the input records are smaller, SIS will expand the records with zeroes or spaces, depending on the user option chosen. TRS always extends with spaces. If a heading record is written, it will never exceed 20 words. ~~The input records must be fixed length.~~ The maximum input and/or output record size is 256 words.

NOTE: Commercial collating sequence will be in the following order:

blank, period, right bracket, right parenthesis, quotes, ampersand, dollar sign, asterisk, hyphen, slash, comma, percent, equals, left parenthesis, left bracket, number sign, greater than, apostrophe, at sign, plus sign, A-I, caret, J-R, underscore, S-Z, 0-9, colon, question mark, less than, backslash, semicolon, exclamation point.

Figure 4-13. SIZES Control Card.

SELECT Control Card

- \* These cards contain an optional field for limiting the number of input records and/or one logic statement. The SELECT card is used by either Phase II or Phase III. If Phase II is executed, the selection is done prior to passing records to the sort/merge, and the SELECT card is ignored by Phase III. If Phase II is not executed, the selection is done by Phase III. In either case, records not meeting the criteria are bypassed. If all records are to be read by Phase II or Phase III, this card is omitted.

ALLOWABLE PREFIX REFERENCES. H (Phase III only)CARD FORMAT:

cc 1-6 cc 7-78

SELECT logic statement

ASSIST positions the terminal to start entering data in cc 7.

EXAMPLE 1:

```
SELECT 1 = "R" OR "Q" OR "C" OR "M" OR "T"
SELECT OR "B" OR "P"
```

- \* Only records with any of the above letters in position one will be input to the appropriate phase.

EXAMPLE 2:

SELECTU2600

The "U2600" indicates that only the first 2600 records are to be used as input to the appropriate phase. This option must be coded with the letter U in cc 7, a numeric value in cc 8-11, and cc 12 must contain a comma if a logic statement follows. If cc 12 is blank, it is assumed no logic statement is present.

EXAMPLE 3:

SELECTQUIT , 67 = "D" TO "M"

The "QUIT ," specifies that the file is sequenced by the field in the logic statement and EOF is to be initiated as soon as the first false condition occurs after a true condition has occurred. The "QUIT ," must be in cc 7-12; cc 11 must be blank. In this example, records with A, B or C in position 67 will be bypassed. Records with D - M will be selected. EOF will be initiated as soon as an N - Z is read.

Figure 4-14. SELECT Control Card.

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HDREC Control Card

The use of this control card is identical to Phase I. If more than one file is input to Phase II, each file (WS-WZ) must have a header record. Furthermore, the Phase II output file (I3) will have as its header record, the last header record from files WS-WZ; and Phase III, if executed, will hold this record. If this card is present and Phase II is not executed, Phase III holds the first record on file I3 just as if Phase II had been executed.

ALLOWABLE PREFIX REFERENCES. NACARD FORMAT:

cc 1-6 cc 7-78

HDREC blanks or FA (see below)

NOTE: In TRS, this control statement is generated if the question "HEADER RECORD ON INPUT FILE (YES or NO)" is answered YES.

If file code "FA" is created in Phase III of SIS executions, it will not contain the header record as the first logical record on the file. If it is desired to write the same HDREC on file FA that was read from file I3, code the letters "FA" in cc 7-8.

The capabilities of the HDR control card have been expanded. Reference figure 4-01 for explicit details on using these options.

LINES Control Card

This control card is used to specify the maximum number of lines on a page that can contain printed data and/or the length of the paper being used. The first parameter is the logical page size. The second parameter is the physical page size. Default sizes of 58 and 66 are used by the program if the LINES card is not present.

ALLOWABLE PREFIX REFERENCES. NA.

CARD FORMAT:

cc 1-6 cc 7-78

LINES logical size, physical size

ASSIST positions the terminal to start entering data in cc 7.

EXAMPLES:

LINES 60

The program uses 60 for logical size and 66 for physical size.

LINES 80,90

The program uses 80 for logical size and 90 for physical size.

\* LINES ,70

The program uses 58 for logical size since the first parameter was not coded and 70 for physical size.

NOTE: If WWMCCS security caveats are specified in the USERID control card, LINES 53,56 must be specified to obtain proper page ejection in SIS. Logical size must be at least three (3) less than physical size or a "BP" abort may occur (paragraph 4.5.2).

\*

Figure 4-16. LINES Control Card.

3

CLASS Control Card

This control card supplies classifications on the report generated on file code PA, and should only be used when the report/product specifications explicitly state that: (1) the pages must be marked to reflect actual classification of the contents of the page, or (2) special length or preprinted form is required and the use of this form precludes the use of the WWMCCS Security Subsystem to print the security classification. If this card is used, the classification lines will take three of the available print lines on each page.

ALLOWABLE PREFIX REFERENCES. NA.\* CARD FORMAT:

cc 1-6 cc 7-45

CLASS up to 36 characters

CLASS nn/up to 36 characters

ASSIST positions the terminal to start entering data in cc 7.

EXAMPLE 1:

CLASS U N C L A S S I F I E D

This will print "U N C L A S S I F I E D" centered at the top and bottom of every page. The default values, or the values entered on a LINES control card, each will be reduced by three (e.g., if no LINES card were entered, values 55 and 63 would be used). The literal is picked up from columns 7-42.

\* EXAMPLE 2:

CLASS nn/U N C L A S S I F I E D

This format functions exactly the same at the first format except the user may specify a starting print position for the value following the slash. This feature is for use with other than standard width print forms. The classification will be treated as format 1 if the value specified for "nn" plus the number of characters in the literal exceed 85; i.e., the classification record is written as 14 words. It will also be treated as format 1 if "nn" are zero or contain alphabetic or special characters. The literal is picked up from columns 10-45 when this format is used. The "nn" value must always be coded as two digits and cc 9 must contain a slash to activate this format.

4



FOOT Control Card

This card is used to supply a Product Control Number (PCN) and/or page number at the logical bottom of each page of the report generated on file code PA (see LINES control card). If it is used, SIS or TRS will internally decrement the values of logical and physical page sizes by three (see LINES control card). This means that if CLASS and FOOT cards are used, these values are decremented by six.

ALLOWABLE PREFIX REFERENCES. NA.

CARD FORMAT:

cc 1-6    cc 7-24  
FOOT~~Ø~~    pcn data  
FOOTS~~Ø~~    pcn data  
FOOTN~~Ø~~    pcn data

ASSIST positions the terminal to start entering data in cc 5.

- \* Format 1 (FOOT~~Ø~~) specifies printing PCN and page numbers on the last logical line of each page. The internal page number will be used; therefore, if it is reset (see PRT control card), this page number will also be reset.
- \* Format 2 (FOOTS~~Ø~~) specifies printing PCN and page numbers on the last logical line of each page. A Sequential page number will be used regardless of the resetting of the page numbers with PRT cards.
- \* Format 3 (FOOTN~~Ø~~) specifies printing of only PCN on the last logical line of each page. No page number will be printed on the line.

For formats 1 and 2, the word PAGE will print in front of the page number and the word END will precede the word PAGE on the last page of the report.

Figure 4-18. FOOT Control Card.

HEAD Control Card

These cards define the report page heading(s). Page headings may contain literal values and/or data from the input records, HDREC or HOLD areas. The first heading should include privacy act markings and/or RCS, as applicable.

- \* ALLOWABLE PREFIX REFERENCES. H, HA, HB, HC.

CARD FORMAT:

cc 1-6 cc 7-78

HEADn field definition entries

n is a sequential character to group cards for the same heading. HEAD cards must be in sequence on cc 5.

ASSIST positions the terminal to start entering data in cc 5.

FIELD SPECIFICATION OPTIONS:

- CCxy This is the carriage control option. If it is used, it must be the first parameter on the HEADn card. The x and y are digits 0-9 or the letter T. The numerals 0-9 indicate spacing of that many lines, while T is used to skip to the top-of-page. The spacing specified by x will take place prior to printing the heading and the spacing specified by y will take place after the heading is printed. If the CCxy option is not used, single spacing will occur. The first heading line should have x=T to position to the top-of-page. If x=T is entered with the CLASS control card, the T will be treated as if it were a one.
- \* / This option specifies the source of data field in the form pn/m; where, p is one of the above prefixes (or null for the input file), n is the location of the field starting character and m is the length of the field. When referencing the input record, m may be from 1 - 132, and m+n must be less than 1536. The G and Z options may also be used (Figure 4-26). These fields are picked up from the first data record on file code I3 and do not change unless control breaks or HOLD areas are used. In this case, the value printed will be the record causing the control break or the last record held in the matching HOLD area. (See paragraph 4.2.2.5.1 concerning the printing of these fields in heading lines when final totals are printing.)

Figure 4-19. HEAD Control Card.

- \* S This option has the form mS, where m is the number of spaces to be inserted into the heading line. The value of m may be from 1 - 132.
- \* T This option specifies the source of data is a table entry (see TABL Control Card) and has the form Tn/m; where, n is the table number (from 1 - 50) and m is the number of characters (from 1 - 18). See paragraph 4.2.2.5.1 concerning the printing of these fields in heading lines when final totals are printing.

Literals Literal values may be specified by enclosing them in quotation marks ("LITERAL VALUE").

- m(1) This option allows a one-character literal to be propagated through a field. The m is the number of positions to be filled with the character 1. (e.g., to print a heading line of all asterisks, code: HEADn CCxy,132(\*) )
- \* C(s,l) This option specifies that field(s) be compressed of multiple spaces before printing and may only be used on the HEAD and PRT cards. The s is the starting print position and the l is the number of positions in the field(s). (e.g., if a file contains fixed length fields for last name (1-20) and first name (21-30), but it is desired to print first name, one space, and last name, code the following: HEADn CCxy,21/10,1/20,C(1,30) ) The "C(1,30)" specifies that compression starts in print position one for 30 characters. The value of s plus the value of l must be less than 134. No spaces are allowed and all compress option descriptions must follow the field(s) to which they apply, not necessarily immediately. If other options follow, the comma must immediately follow the closing parenthesis. Do not include the spaces option, literals, group or zero suppression, or the M, D, Y, N, J, JY, JD, JT, JH, JM and P options in the range of a compress; nor use on a PRT line that will be redefined.
- P This option inserts a five-character, zero suppressed page number into the heading line. Page counts may be reset at various points (see PRT Control Card).
- M,D,Y,N These options refer to the two-character month (M), day (D), year (Y), and the three-character name of the month (N).
  - \* The system date is used as of the start of Phase III.

Figure 4-19. HEAD Control Card. (cont'd)

- \* J This option inserts the SIS job's five-character SNUMB number, a hyphen, and the two-character activity number into the print line (e.g., K3654-03). In TRS, zeroes will be printed.
- \* JY Julian date, in the form YYDDD (five print positions).
- \* JD Julian day, in the form DDD (three print positions).
- \* JT Job time, in the form HH.TTT (six print positions).
- \* JH Job hour, in the form HH (two print positions).
- \* JM Job thousandths-of-hour, in the form TTT (three print positions).

The JD, JH, and JM figurative literals are provided in the event punctuation other than that provided by JY and JT is needed. All J- figurative literals must be coded with no space(s) between the J and the second letter.

Options must begin after cc 6, be separated by commas, and cannot exceed cc 78. Imbedded blanks are ignored except in the case of literals and as noted above in the compress and J-figurative literals.

- \* EXAMPLE: (positions not specified are blank)

```
HEADA CCT2, 28S, "HEADING", 5S, M, "-", D, "-", Y, 15S, 54/6
HEADA 13S, JT, 10S, "PAGE", P
```

<u>POSITIONS</u>	<u>CONTENTS</u>
29-35	HEADING
41-42	Two-character month (e.g., 06)
43	-
44-45	Two-character day of month
46	-
47-48	Two-character year (e.g., 79)
64-69	Data from positions 54-59 of first input record or the last record which caused a control break. (See paragraph 4.2.2.5.1)
83-88	Time Phase III started executing (e.g., 20.153)
99-102	PAGE
103 -107	Page number

Figure 4-19. HEAD Control Card. (cont'd)

HOLD Control Card

- These control cards specify that certain records from the input file are to be held in memory until replaced by another record of the same type. Three areas of 20 words each are available by default; however, the size of the areas may be specified on the OPTION card (paragraph 4.2.2.5.1) in SIS or with the HSZE command in TRS (paragraph 6.2.3.1). These areas are initially filled with dollar signs and will be obtained if the hold areas are referenced before a record has been held.

ALLOWABLE PREFIX REFERENCES. H.CARD FORMAT:

cc 1-6 cc 7-78

HOLDxy logic statement

- \* x is the area in which the record is to be held; i.e., A, B or C.
- y is the letter I if this input record is also to be processed.

A record may satisfy only one HOLD logic statement; that is, if it satisfies the check for HOLDA, it is not considered for HOLDB or HOLDC.

ASSIST positions the terminal to start entering data in cc 5.

EXAMPLE:

HOLDAØ 3 = "1" OR H3 = "A".

- \* At any point during Phase III, HOLDA will contain the last record from file I3 that had a "1" in position 3 or that was evaluated when HDREC record contained "A" in position 3. The input record will only be held, not processed through any other control statements, since the letter I was not placed in cc 6.

Figure 4-20. HOLD Control Card.

CTL Control Card

This optional card specifies the control breaks desired. Up to nine control levels may be specified. Level 1 is the most minor and level 9 is the most major. Control breaks apply only to data that is on file I3; i.e., the current record;  
\* therefore, no other areas may be referenced. All COMPUT statements are executed each time any control break is taken, including final totals. (See figure 4-24)

ALLOWABLE PREFIX REFERENCES. None.

CARD FORMAT:

cc 1-6 cc 7-78

CTL~~XXXX~~ B1 = n/m, B2 = n/m ...

ASSIST positions the terminal to start entering data in cc 7.

EXAMPLE:

CTL B1 = 21/4, 35/2, B2 = 1/5, B3 = 14/1

The most minor control will be on two fields; positions 21-24 and 35-36. The intermediate control break will be on positions 1-5. The major control break will be on position 14. The break level number must be preceded by the letter B.  
\* Additional cards may be used; however, an entry must be complete on a card. Only the first 1536 characters (256 words) of records are available for control breaks.

A higher control break automatically causes lower breaks to be taken. That is, in the above example, if position 14 changes, control breaks 1 and 2 will be taken before break 3. (See PRT card description for action taken when breaks occur.)

A count of the number of times each level is executed is displayed upon completion of Phase III. These counts indicate only the number of times the break was taken because the field(s) changed, not when lower levels are executed because higher level break(s) occurred (i.e., if B2's field changes, the counter for B1 is not incremented).

Figure 4-21. CTL Control Card.

IF Control Card

These control cards specify conditions which are tested when numeric data is entered into Phase III counters (see CNTRS Control Card). The IF cards must be submitted in sequence by the number punched in cc 3-4. The purpose of the IF card is to set a true or false condition based on a logic statement so that CNTRS can be updated conditionally.

ALLOWABLE PREFIX REFERENCES. H, HA, HB, HC.

CARD FORMAT:

cc 1-6      cc 7-78  
IFnn      logic statement

nn is a two-digit number from 01 through 99 and must be in sequence by this number. There is a maximum of 99 IF statements in Phase III, but they may be continued on up to 21 cards each.

ASSIST positions the terminal to start entering data in cc 3.

EXAMPLE:

IF01 5 = "3" AND (38 = "ABC" OR HA38 = "ABC")

Condition is true if position 5 of the input record is a "3" and position 38 is "ABC" OR position 38 of HOLDA is "ABC".

Note that Phase I also has a limit of 99 IF statements which are not related to Phase III IF statements. That is, there may be 99 IF statements in both Phase I and Phase III.

Figure 4-22. IF Control Card.

CNTRS Control Card

The use of these cards is nearly identical to Phase I usage, the difference being the X type of data conversion. In Phase I, the X type is used to set a counter to one (1). In Phase III, it means to add one (1) to the counter. The number of counters available at each control level is calculated using the formula  $N = ((561/C) - 1)$  where; C is the highest control break specified (see CTL card), plus one (1) if final totals are specified (see PRT card), plus one (1) if detail listing is used (see PRT card), plus one (1) if running totals are used. In any case, a minimum of 50 counters is available. Source data can be entered only at the detail level and is automatically rolled into higher level counters. Counters should be assigned starting with one (1) and serially thereafter (i.e., if C1 and C10 were used, the areas for C2 - C9 are allocated, even though they are not used).

ALLOWABLE PREFIX REFERENCES. H, HA, HB, HC.

CARD FORMAT:

cc 1-6 cc 7-78

CNTRS one or more pairs of operators

ASSIST positions the terminal to start entering data in cc 7.

EXAMPLE:

CNTRS C1 = 5\$6, C2 = HA4/6, C3 = HB5\$8 IF01

- \* Each counter is preceded by the letter C. Following the equal sign in each pair of operators is the source and type of data. In the above example, 5\$6 means the data is in BCD (\$) and is in positions 5-10 of the input record. The HA4/6 specifies that the data is in positions 4-9 of HOLDA and is in binary (/). The last entry specifies the data is in positions 5-12 of HOLDB and is BCD (\$) and is to be placed into the counter only if the logic statement "IF01" is true.

- \* For data type BCD (\$), the maximum size field is 15 characters and the field must consist of all numerics, letters A-I (treated as positive), caret or letters J-R (treated as negative). Any other value will cause an ILLEGAL EIS DATA abort. For data type BINARY (/), the maximum size field is 12.

Figure 4-23. CNTRS Control Card.



The IF option may be used with any type of data field, as follows: (IF numbers must always be two digits.)

CNTRS C5 = 5\$6 IF02, C6 = X IF03

Counter 5 will be set to the BCD value in positions 5-10 of the input record if condition IF02 is true. Counter 6 is incremented by one if the condition IF03 is true.

The detail level (level zero) counters are cleared after processing of each input record. They are added to level one counters for each input record before clearing. Level one counters are added to level two counters and cleared when a control break occurs at level one, etc. Counter 1 is always referred to as C1, no matter in what level of control the reference is made. In other words, accumulation of counters is automatic. (See figure 4-24 for restrictions of use.)

NOTE: No spaces are allowed when defining the field starting location, type of data, and length; e.g., 5\$6 .

In Phase III, values are always added to the counter by a CNTRS statement; therefore, the same counter may be used to sum data fields in the same record. For example, suppose positions 6-9 contain "0645" and positions 25-26 contain "27". The following example will result in the value "0672" being placed into counter 5.

CNTRS C5 = 6\$4, C5 = 25\$2

Figure 4-23. CNTRS Control Card. (cont'd)

\* COMPUT Control Card

The Phase III COMPUT card is identical in format to the Phase I card (see figure 4-09), with the following exceptions:

The special figurative literals JD (julian day), JH (hour of day), and JM (thousandths-of-hours) may be used in Phase III COMPUT cards only. The values used for hours and thousandths of hours are based on the 24-hour system clock as of the start of Phase III. NOTE: Thousandths of hours may be converted to minutes using the following COMPUT statement:

COMPUT Cn = JM \* 6 / 100 (use backslash to prevent rounding)

The value can be printed using edit pattern D and two print positions; e.g., C6D/2.

Each control break and final total executes the COMPUT statements prior to printing the line(s) and/or writing the RCD format(s) and accumulating values to the next higher level, if any. Therefore, the user must be aware that crossfooting totals will not balance if multiplications and/or divisions are included in the COMPUT card(s). The following example will illustrate this: (each line represents an input record from file code I3)

(C1)	*	(C2)	/	(C3)	=	(C4)
605		432		24		10890
799		99		16		4944 (rounded from 4943.8)
43		7		5		60
2468		631		31		50236 (rounded from 50235.7)

As each record is read from file I3, the values are accumulated into the next or final level's counters. In the example, at final total time, the following values would be in the counters:

(C1)	(C2)	(C3)	(C4)
3915	1169	76	66130

However, when the final total routine executes the COMPUT statements, the value in C4 is replaced with 60219 which is the result of  $(3915 * 1169 / 76)$ ; therefore, the column printed for C4 will not crossfoot vertically.

Figure 4-24. COMPUT Control Card.

TABL Control Card

- \* These cards request Phase III to perform a table lookup within the input record and are used for converting data codes to literals or constants. The first card of each TABL must begin with a parameter specifying the leftmost character location of the field to be checked. The TABL cards have a table number in cc 5-6 and must be numbered identically for the same table if continuation cards are required. Up to 50 tables may be created and the cards must be in sequence on cc 5-6.

ALLOWABLE PREFIX REFERENCES. H, HA, HB, HC.

CARD FORMAT:

cc 1-6 cc 7-78

- \* TABLnn ll, "v1" = "literal", "v2" = n/m, ... D = (see below)
- ASSIST positions the terminal to start entering data in cc 5.
- nn is the table number, from 01 through 50.
- ll is the leftmost character of the field in the input record. References to HDREC and HOLD areas are legal.
- v1 is value 1 to be compared for.
- "literal" is the data to be used if the field matches v1.
- v2 is value 2 to be compared for.
- n/m is starting location and length of another field to be used if the field being tested matches v2.

EXAMPLE:

TABL01 31,"01" = "ALABAMA", "02" = "ALASKA", "03" = "ARIZONA"  
TABL01 "99" = 24/4, D = 31/2

In this example, if positions 31-32 of the current input record are 01, 02, or 03, the corresponding constant will be available for output from T01 as described in the HEAD card and PRT card. That is, if the PRT card calls for T01/7 and the current input record contains 02 in positions 31-32, the value "ALASKA" will be printed. The space is automatically

Figure 4-25. TABL Control Card.

provided since the value "ALASKA" was shorter than the number of print positions requested. The "99" entry specifies that if the current input record contained "99", the value printed is contained in positions 24-27 of the same record. The last entry of the letter D means the default value if none of the table entries are matched. If D were not specified, SIS or TRS would automatically provide asterisks if no match is found in the table. The example overrides the standard default of asterisks to print the value found in positions 31-32 if no match is found. A literal may also be specified for the default substitution value.

The following rules apply to coding a TABLnn table:

1. The equal signs are not required as shown, but aid in clarity when reading the table entries later. If they are used, they should be preceded and followed by at least one space.
2. There is no maximum number of entries each table may contain. If large tables are used, the storage requirements on the \$ LIMITS control card may have to be increased in SIS. (see NOTE below)
3. A pair of entries (the value to compare to and the substitute value) must be completed on the same card.
4. All constants as the first entry of a pair must be the same length for the same table and may not exceed six characters.
5. Literals as the second entry of a pair do not have to be the same length, but must not exceed 18 characters.

NOTE: Each table built has two words of control information, then four words for each entry in the table, then four words for the default entry. (i.e., if a table consists of 300 entries, the storage requirements would be  $(2+(301*4))$  or 1206 words). The user may notice an increase in processor time when table(s) exceed 256 entries since the table(s) must be searched with a program loop instead of the hardware repeat (RPT) instruction.

Figure 4-25. TABL Control Card. (cont'd)

PRT Control Card

These cards specify print line formats on report code 21. Options are available on the PRT cards of CCxy, mS, n/m, Tn/m, M, D, Y, N, J, literals, repetitive literals and field compression. These options are described under the HEAD card and are not repeated here. If the CCxy option is used with a T as the x value, all page footings (FOOT card), classifications (CLASS card) and headings (HEAD cards) will be generated as appropriate before printing the line.

ALLOWABLE PREFIX REFERENCES: H, HA, HB, HC, T.

CARD FORMAT:

cc 1-6      cc 7-78

PRTlsr      field definition entries and options

- l      is the level number at which this line is to be printed. Zero (0) is used for detail print line formats. The numbers 1-9 are used to define format(s) for control break lines and must correspond with the break numbers specified in the CTL card(s). The letter F is used to define format(s) for final total lines.
- s      is a sequential character for successive print lines at the same control level.
- r      the letter R placed in cc 6 of the first PRT card describing any print line causes the page count to be reset after printing that line. The letter Z in cc 6 of the first PRT card describing a control level print line will cause the cumulative total counters to be reset after printing and processing of that control level.

ASSIST positions the terminal to start entering data in cc 4.

FIELD SPECIFICATION OPTIONS:

Group Indication: If it is desired to print certain fields or table values only on the first line of each control break or page overflow, the letter G may be substituted for the slash (/) when defining field source (e.g., 5/6 would print positions 5-10 of every input record while 5G6 would print only on the first line of each break or page overflow).

Figure 4-26. PRT Control Card.

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- \* Zero suppression: If it is desired to suppress leading zeroes in a field on the listing, the letter Z may be used instead of the slash when defining field source (e.g., 5Z6 would specify field location of 5-10 and that leading zeroes be replaced with spaces). If the field consists of only zeroes, all will be replaced with spaces.
- \* Counter editing: In specifying that the contents of a counter is to be printed, the user supplies a letter indicating the type of editing pattern to be used. The following table is used to select the proper edit pattern letter:

PATTERN	COBOL PICTURE	PATTERN	COBOL PICTURE	MAXIMUM PRINT POSITIONS
A	Z(n)	J	Z(n-1)9	15
B	Z(n-2).Z	K	Z(n-2).9	16
C	Z(n-3).ZZ	L	Z(n-3).99	16
D	9(n)	M	9(n)	15
F	Z,ZZZ	O	Z,ZZ9	19
G	Z,ZZZ.Z	P	Z,ZZZ.9	20
H	Z,ZZZ.ZZ	Q	Z,ZZZ.99	20

Z=blank and no preceding punctuation when zero.

9=zero and preceding punctuation when zero.

n=number of print positions specified.

To print counter 21 using edit pattern H, code: C21H/m  
where m is the number of print positions to be used.

If negative signs are desired when the counter contents are negative, follow the pattern letter with the letter S (e.g., C21HS/m). Each edit pattern's maximum length is increased by one if this option is used.

- \* Cumulative Totals: Cumulative totals are defined by using the letter R (running) instead of the letter C when referencing a counter. These counters are reset using the letter Z in cc 6 as defined earlier (e.g., R21H/m).

\* EXAMPLES:

PRT11 CC31, 5S, "MINOR TOTAL", 5S, C1A/5, 3S, H15/3, 3S  
PR11 C15KS/11, 2S, "\$", R21CS/8, 4S, 23/4

This line will print on minor total breaks (cc 4 = 1 for break level 1). It will be formatted as follows: (print positions not specified are blank).

Figure 4-26. PRT Control Card. (cont'd)

<u>POSITIONS</u>	<u>CONTENTS</u>
6 - 16	MINOR TOTAL
22 - 26	Contents of counter 1 using edit pattern A.
30 - 32	Contents of HDREC positions 15-17.
36 - 46	Contents of counter 15 using edit pattern K (print zero when zero) and sign control.
49	\$
50 - 57	Contents of counter 21 using edit pattern C and sign control.
62 - 65	Positions 23-26 of the current input record from file "I3".

Note that counters 1 and 15 are reset after this line is printed, but counter 21 is not because the letter R was used to prefix the counter number.

Print lines may be "redefined" with minor changes with the following shorthand method:

```
PRT11 CC02, "MINOR TOTAL", 5S, C11A/5, 3S, C12A/5, .....
PRT21 CC12, "MAJOR TOTAL", 5S, C11A/5, 3S, C12A/5, .....
PRTF1 CCT1, "FINAL TOTAL", 5S, C11A/5, 3S, C12A/5, .....
```

Since the only differences in the above examples are the CC options and the words "MINOR", "MAJOR" and "FINAL", they may be coded as follows:

```
PRT11 CC02, "MINOR TOTAL", 5S, C11A/5, 3S, C12A/5, .....
PRT21 CC12, PRT11, "MAJOR"
PRTF1 CCT1, PRT11, "FINAL"
```

- \* SIS/TFS will automatically pick up the portion of the previously defined line (PRT11) that was not changed.

When specifying new fields in the duplicated record, those fields which are defined in the original using /, G or Z may only be replaced by the same type of field. Literals, spaces, M, D, Y and N may replace each other. If this feature is used, it must be coded first, or immediately after the CC option.

- \* NOTE: If the data being printed contains the BCD characters exclamation point (octal 77) or question mark (octal 17), slewing and/or line length will be erratic when directed to an online or remote printer.

Figure 4-26. PRT Control Card. (cont'd)



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RCD Control Card (SIS only)

These cards are used to request data record output to be written on file code FA in system standard format. These cards are, for the most part, identical to the PRT cards except they define data record outputs instead of print lines. The only counter output formats are D and E. The other exception is the mS option, which inserts zeroes instead of blanks into the records unless a \$ SET 22 JCL card was included in the execution deck, or the SPACES option was used in the OPTION card.

ALLOWABLE PREFIX REFERENCES. H, HA, HB, HC, T.

CARD FORMAT:

cc1-6 cc7-78

RCD1s field definition entries and options

- 1 is the level number at which the record is to be written.
- s is a sequential character for successive records at the same level.

(This control card is not valid in TRS unless the RUNB command is used.)

FIELD SPECIFICATION OPTIONS:

All options, except group suppression and as noted above, that apply to the PRT card also apply to the RCD card. The first field in the RCD card must be Lnn, where nn is the number of words to be written in the output record. The maximum is 256 words. The zero suppression feature is only supplied in the RCD card for Phase III, not Phase I.

Counter Editing: In specifying that the contents of counters be placed into output records, only two edit patterns are available in the RCD card. CnnD/m gives an m-position BCD field which is equivalent to COBOL S9(m). CnnE/m gives an m-position binary field. If m is 6 in the binary type field, it is equivalent to COBOL S9(8) COMP-1 or S9(10) COMP-3. If m is 12, it is the COBOL equivalent of S9(18) COMP-1 (two words). Note, however, that binary fields will not automatically fall onto word boundaries unless the user orients them within the record being created.

EXAMPLE:

RCD12 L14, 1/25, C13D/6, 5S, C14E/6

This card will produce a 14-word record whenever a minor total break occurs. The record will contain the following:

Figure 4-27. RCD Control Card.



<u>POSITIONS</u>	<u>CONTENTS</u>
1 - 25	Positions 1-25 of the record prior to the one which caused the control break.
26 - 31	Counter 13 as a 6-position BCD number.
32 - 36	Zeroes or spaces, depending on bit 22 of Program Switch Word.
37 - 42	Counter 14 as a one-word binary number.
43 - 84	Zeroes or spaces.

RCD cards must fall into sequence with PRT cards in Phase III. If there are RCD and PRT cards at the same control level, RCD cards must precede the PRT cards.

RCD01	(detail level data output)
RCD02	(detail level data output)
PRT03	(detail level printed output)
PRT11	(minor control break level printed output)
RCD21	(intermediate control break data output)
PRT22	(intermediate control break printed output)
RCDF1	(final total data output)
PRTF2	(final total printed output)

If records are generated at more than one level, or multiple records are generated at the same level, it is the user's responsibility to insert some means of distinguishing between such records. This may be done by inserting various literal values into the records.

If no printed report is required, HEAD and PRT cards may be omitted. A count of total generated records is found on SYSOUT if any RCD cards are entered into Phase III.

The V option, as described on page 3-17, is also available in Phase III for assigning file code FA an output label.

It is necessary to supply a CTL card specifying any field as control break to force detail records to be written on file code FA when there are no PRT cards for Phase III (e.g., CTL B1 = 1/1).

Figure 4-27. RCD Control Card. (cont'd)

LABL Control Card

A LABL card may be supplied if file identifiers for output files I3, FA and PA are desired. If this card is used, it must precede all Phase II and/or III control cards. It is listed last since the "V" option in RCD and PRT cards is the preferred method of assigning file identifiers.

ALLOWABLE PREFIX REFERENCES. None.

CARD FORMAT:

cc1-6 cc7-18

LABLff vvvvvvvvvvvv

ff is the appropriate file code. I3 to assign a file identifier to the sorted output of Phase II. PA to assign a file identifier to the report output of Phase III. FA to assign a file identifier to the records output of Phase III, if used.

vv..vv is up to 12 characters, that must start in cc7, to be used for the file identifier.

EXAMPLE:

LABLI3SORTED-SIS

This will place the value "SORTED-SIS" into the file identification field of the file control block for file I3 before it is opened.

NOTE: A LABLFA card must be supplied if RCD cards are used in Phase III and the V option is not used. The MAJCOM ID must be placed in cc 16-17 if an AF standard file is being created.

Figure 4-28. LABL Control Card.

## PART THREE - TIMESHARING RETRIEVAL SUBSYSTEM (TRS)

## SECTION 5. SYSTEM SUMMARY

5.1 System Application. The TRS provides most of the retrieval capabilities of SIS and operates in an online mode. The terminal user is provided with commands that allow construction of retrieval statements, execution of the retrieval in the TSS or batch environment, examining the printed report and directing it online or to a remote printer. The features of SIS not supported in TRS are squeeze coding in the SORT and RCD file creation in Phase III.

5.2 System Operation. NA.

5.3 System Configuration. TRS is designed for use on all WWMCCS H6000 level computers utilizing TSS and will execute under any WWMCCS release from 6.0 forward.

5.4 System Organization. The TRS subsystem consists of a driver program, an edit program and three phases, which may be executed individually or in combination at the desire of the user depending on the specified requirement or application.

5.4.1 TRS Driver. The driver program accepts commands from the terminal user, directs all activities and consists of the following program which is loaded to CMDLIB/TRS:

QITLFO (TRS Driver)

5.4.2 Editing. The edit program syntax checks retrieval statement, provides any error messages and consists of the following programs which are loaded to CMDLIB/TRSA:

QITAFO (Edit Program)

QITLFO (Logic Code Generator)

5.4.3 Selection. The selection phase (Phase I) provides multiple input files and consists of the following programs which are loaded to CMDLIB/TRSB:

QITBFO (Selection)

QITLFO (Logic Code Generator)

QITFFO

QITGFO

QITHFO

QITIFO

QITJFO (Modules to support ISP files under TSS)  
QITKFO  
QITMFO  
QITNFO  
QITOF0  
QITPFO

5.4.4 Sort. The sort phase (Phase II) provides the ability to sort records and consists of the following programs which are loaded to CMDLIB/TRSC:

QITCFO (Sort Control Program)  
QITLFO (Logic Code Generator)  
QITSFO  
QITTFO  
QITUFO (Modules to support SORT under TSS)  
QITVFO  
QITWFO

5.4.5 Report. The report phase (Phase III) generates a report file which can be examined by the terminal user. Data files cannot be created using TRS as in SIS. The report phase consists of the following programs which are loaded to CMDLIB/TRSD:

QITDFO (Report Generator)  
QITLFO (Logic Code Generator)

5.5 Performance. The TRS subsystem allows great flexibility on the part of the user regarding type of input, selection and sort capability, and report generation.

5.5.1 Phase I. Phase I accepts system standard, data compacted or ISP format files, optionally matching another file in the same sequence and optionally retrieving data from auxiliary ISP files. Records may be created in up to 64 different user defined formats on up to eight files. Such output records may contain data from any or all input files, calculated values and/or literals. Selection criteria based on comparison conditions using AND and OR logic may be applied to input and output files.

5.5.2 Phase II. Phase II reads up to eight system standard or data compacted files, applying optional selection criteria, sorts the data on user specified fields and creates one system standard format file.

5.5.3 Phase III. Phase III reads a system standard or data compacted file, applies optional selection criteria and generates a report file which may be manipulated by the terminal user. The report can contain detail lines and/or summarizations at up to nine levels plus final totals. Page headings, column headings, classification, editing, and zero suppression, etc., are available. A full range of calculations may be employed to provide averages, percentages, counts of data fields meeting user specified criteria or within ranges and more complex formulas. Cumulative totals are available and may be reset at various points during the creation of the report.

5.6 Data Base. TRS will accept system standard, data compacted or ISP files and data bases (paragraph 5.5.1). The use of a specific file or data base is the decision of the user based upon requirements and user application of TRS. All files/data bases used as input to TRS must reside on direct access devices due to a TSS restriction.

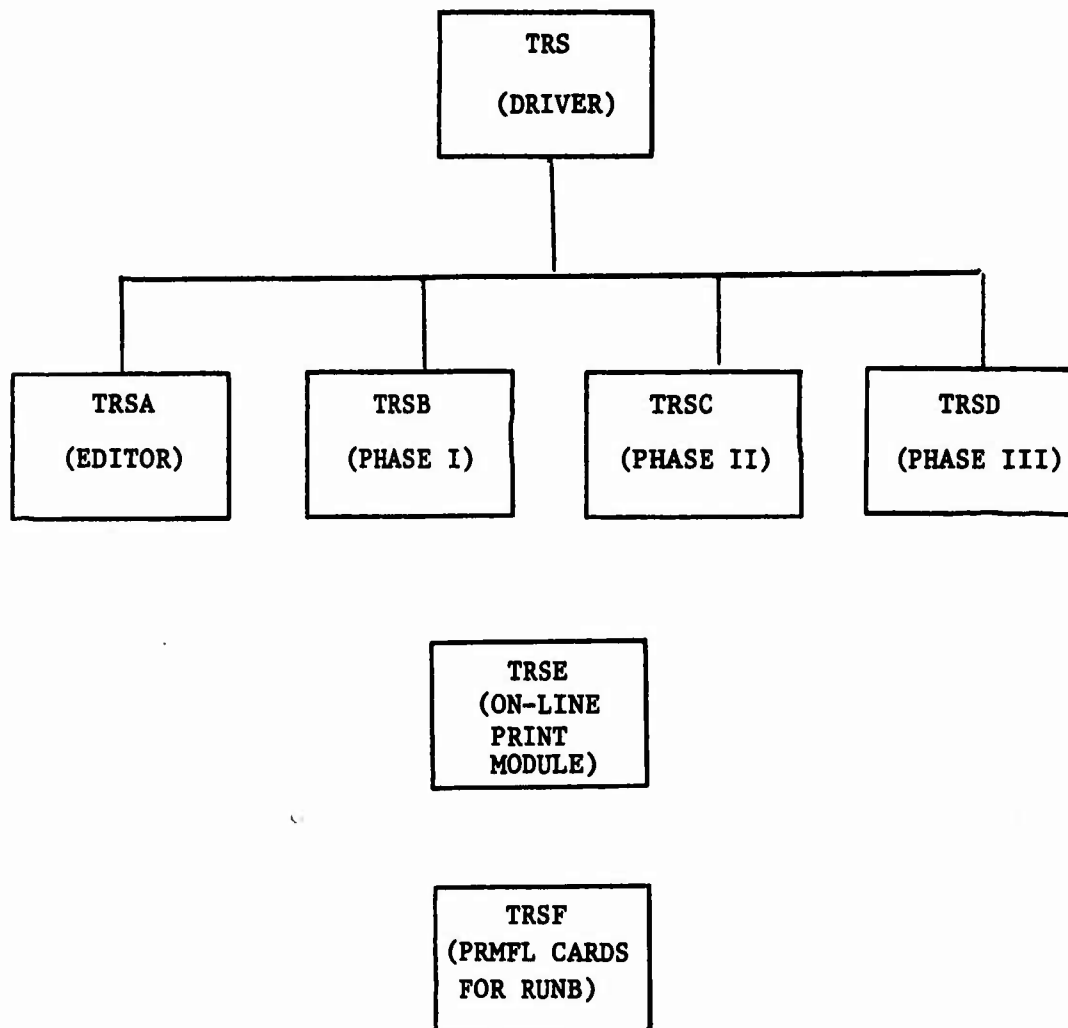
5.7 Generalized Description of Inputs, Processing, Outputs:

- \* 5.7.1 Inputs. Inputs are determined by each user. The following actions are taken for logical records from file codes I1, I2, WS - WZ, and I3: Variable length records may be used for system standard files. Compacted and ISP files must contain fixed length records. System standard and decompacted records are always considered to be 256 words in length, with all character positions beyond the actual length, if any, filled with blanks. If an input file contains print image data (media code 3) records, the last word of each record is assumed to be a slew word and is blanked out in the logical record area. If the record is only a slewing word, it is bypassed and a count is displayed at EOF. The input file(s) should not contain HDRECs when used with Phases II and III if media code 3 records are used. The maximum size TRS will read and/or write is 256 words or 1536 characters. All data must be binary coded decimal (BCD) or pure binary format.

5.7.2 Processing. The specific TRS options used during processing are determined by each user according to application.

5.7.3 Outputs. Quantity, type and format of the output from TRS is determined by each user based on the application. AFM 171-100 standards should be observed.

5.8 Field Assistance. For assistance in preparing Difficulty Reports (DIREPs) and/or incident reports, contact AFSDSDC/SDMC, AUTOVON 921-4305.



NOTE: The DRIVER program controls execution of the Retrieval phases and contains the ASSIST, RUN, RUNT, RUNB, LOOK commands and file definition routines.

Figure 5-01. TRS System Components on CMDLIB.

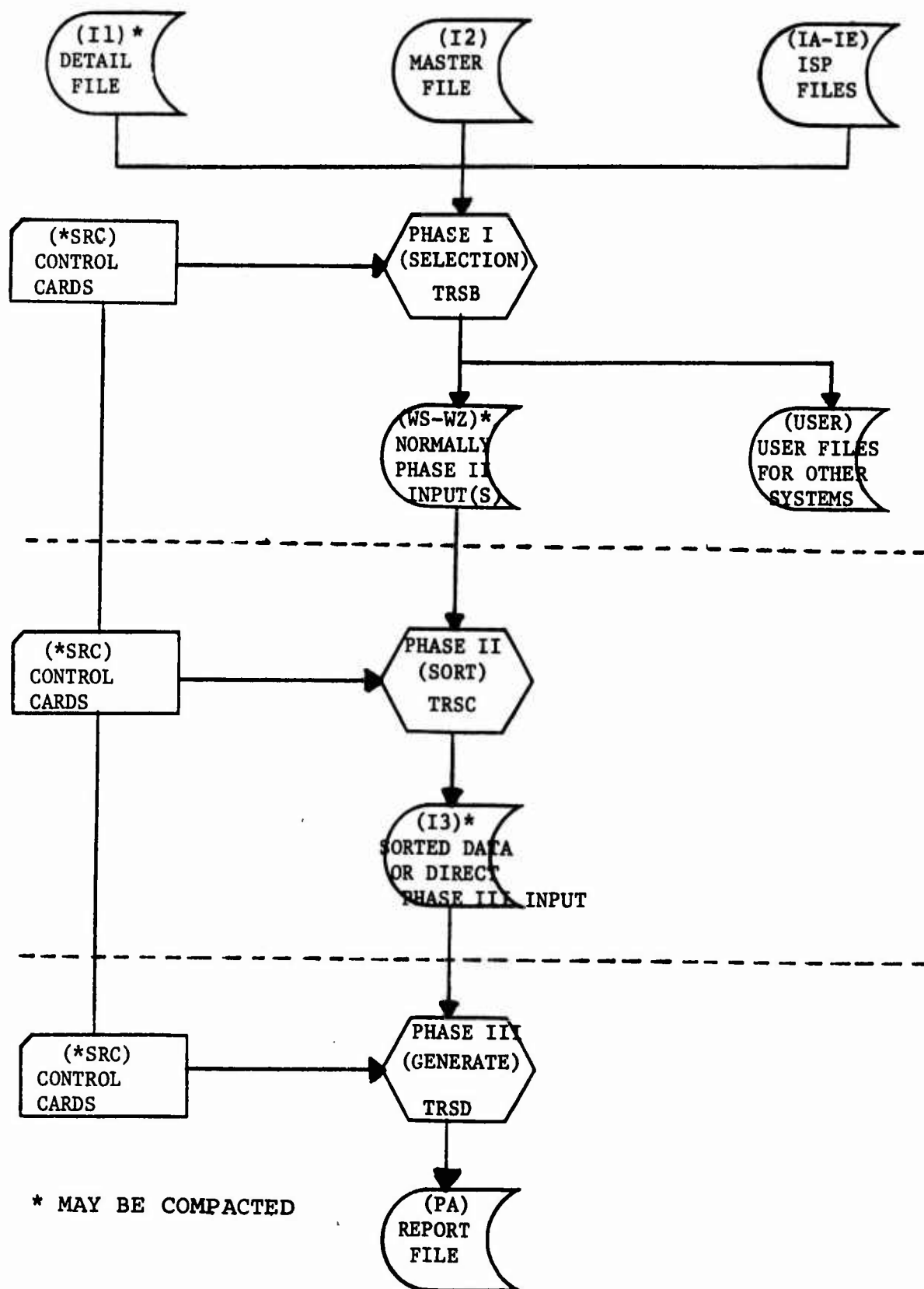


Figure 5-02. TRS Input/Output Files.

## SECTION 6. STAFF FUNCTIONS RELATED TO TECHNICAL OPERATIONS

6.1 Initiation Procedures. The TRS subsystem is initiated by logging on to TSS and entering TRS at the SYSTEM level.

6.2 Staff Input Requirements. The requirements to be observed in preparing entries to the subsystem shall be determined by each user according to local applications and procedures.

6.2.1 Input Formats. The input formats for files or data bases used with TRS are dependent on each user's choice of which local files or data bases are utilized.

6.2.2 Composition Rules:

6.2.2.1 Detail and Master Files. For the purpose of TRS, all references to "Detail" and "Master" files should be considered as if the "Detail" file is a series of transactions that is being processed against an existing larger file called the "Master" file. The "Detail" records cause all other actions to be taken within Phase I.

6.2.2.2 Control Cards/Input Data. The user must supply control cards directing TRS to perform the necessary retrieval functions to satisfy the request. These control cards may be built using the ASSIST command (paragraph 6.2.3.2) or may reside on an existing TSS file in ASCII format. Comment cards, identified by an asterisk in column one, may be placed at any point in the deck. Line numbers are automatically stripped when any of the

\* RUN commands are entered. Control cards may consist of all ASCII characters except: at sign, underscore, tilde, vertical line, and left and right braces. The colon (:) character must not be used when any form of "RUNB" will be entered.

6.2.2.3 Error Messages:

a. If any control statement syntax errors are found during editing, explanatory messages will be printed at the terminal following the statement in error. An error number is contained in each message. The TRS syntax messages correspond with the SIS messages which are contained in paragraph 4.5.1 and are not repeated in this section.

b. If the command or verb entered cannot be recognized or cannot process the requested action, a message will be displayed at the terminal. These messages are listed in paragraph 6.5.1.

6.2.2.4 Logic Statements. The DTL, MST, HOLD, IF, WRIT, and SELECT control cards require logic statements to identify the



type of data being manipulated. A TRS logic statement is identical to one in SIS; therefore, the narrative is not repeated in this section. Paragraph 4.2.4.2 contains detailed information on the coding of logic statements and should be read prior to using any of the above control cards.

6.2.3 Input Vocabulary. Following is a description of how to enter the TRS subsystem, all commands that are unique to TRS and other TSS subsystems that can be used from within TRS.

6.2.3.1 Entering the TRS Subsystem:

a. To enter the TRS using an existing control statement file, which must be in TSS ASCII format, the following sequence is used on the terminal: (The existing file may contain the OPTION statement used by SIS, but is ignored by TRS. No RCD cards for Phase III may be present unless the RUNB command is used.)

```
SYSTEM? TRS OLD filedescr  
READY
```

#

(The # always indicates TRS is ready to receive a command.)

b. To enter TRS to create a new control statement file, the following sequence is used on the terminal:

```
SYSTEM? TRS NEW  
READY
```

#

c. The following is a list of TRS unique commands that may be entered at the command level (i.e., following the # character) and a brief description of each. A full description of each command is contained in paragraphs 6.2.3.2 through 6.2.3.14. Paragraph 6.2.3.15 is a list of other TSS subsystems that may be used while in TRS. The underlined portion of each command must be entered, the remaining characters, if any, are optional.

ASSIST

This command initiates a question and answer sequence to allow the user to construct TRS retrieval statement.

CHECK This command syntax checks the control cards on \*SRC. (See "RUNBN" below if RCD cards are present for Phase III)

LOFF This command suppresses printing of control cards when the EDIT program is entered.

LON This command resets the LOFF option and is the default setting.

WOFF All WRIT statements in Phase I may be true. This is the default setting when TRS is entered.

WON Phase I allows only one WRIT statement to be true for each detail input record.

VON Variable data is allowed in final heading lines. This is the default setting.

VOFF Variable data is not allowed in final heading lines.

HSZE nnn Sets the size of HOLD areas in Phases I and III. Values may range from 020 - 256 and remain in effect until changed by another HSZE command. "HSZE ?" may be entered to display the current size.

RUN Spawns a batch job from an existing file or executes a retrieval entirely within TSS.

RUNT Executes a TSS retrieval using a user specified record count to terminate the first phase executed.

RUNB  
RUND Spawns a batch SIS execution after syntax checking the control cards and prompting the user for file definitions. Generated JCL and control cards may optionally be saved to a PRMFL.

RUNBN  
RUNDN Same as RUNB/RUND except the job is not spawned. The created JCL and control cards may be saved to a PRMFL. This command may also be used to syntax check retrievals containing RCD cards for Phase III that will be run with SIS. If no errors are found, enter a BREAK when the \$ IDENT request is issued and control will return to the # level.

RUNBS  
RUNDS Same as RUNB/RUND except the terminal enters the DJST subsystem following the PRMFL NAME? question.

- SNUMB Displays up to the last ten snumb numbers in the snumb table. Snumbs from RUNB/RUND, TRANSFER and sometimes after a CALL command are automatically entered into this table. (See SNUP). The command "SALL" may be used to enter DJST for all SNUMBs in the table.
- \* SNUPnnnnn Adds the snumb number immediately following the command to the table. If no snumb number follows the command, the last snumb spawned is retrieved from the UST. This word in the UST is also used for completion codes when batch jobs terminate; therefore, any snumb beginning with "0000" is not stored in the table since it is assumed to be a completion code.
- \* SNZENnnnn Removes the snumb immediately following the command from the table. If no snumb number follows the command, the entire table is zeroed. A snumb is normally removed only when it is pushed out the bottom of the ten entry table; i.e., the eleventh entry is made.
- LOOK Causes the print file (PA) to be available for viewing by the user. See paragraph 6.2.3.12.
- \* DONE TRS returns to the calling TSS level after removing  
DONEN all TRS two-character file codes from the AFT. The  
DONEN form leaves the AFT intact.
- \* CLEAR This command clears a VIP screen.
- IDNT Displays the last value entered in response to an IDENT ? request in RUNB/RUND or TRANSFER.
- OPTS Displays settings of "LON/LOFF", "WOFF/WON" and "VON/VOFF" commands, current HSZE value, and enters the IDNT and SNUM routines.
- COMMANDS Displays the first four characters of all TRS commands, all TSS subsystems that can be directly entered from TRS and all LOOK command verbs.

- 6.2.3.2 The ASSIST Command. The ASSIST command is used to initiate a series of questions at the terminal which prompt the user in the construction of retrieval statements. Each type of card is displayed and the user enters only the variable portion of the card. If the first character is an asterisk, the entire line is treated as a comment and the fixed portion is repeated. To indicate a particular statement is not used in this retrieval, only a carriage return is
- \*

entered. Control statements which allow multiple occurrences will repeat until only a carriage return is received. Figure 6-01 contains the hierarchy of questions displayed. Indented lines will not be displayed if the question at the next higher level was answered "no" or with only a carriage return. Lines marked with an asterisk indicate user response is expected. Phase III is assumed to be required. If this is not the case, the "break" key may be depressed or a dollar-sign (\$) may be entered, which causes the current file (\*SRC) to be closed normally at that point. Control will then return to the # level. The control card formats are defined in figures 4-01 through 4-28 and are not repeated in this section. The term "card" is used to represent a line of data entered from a terminal.

6.2.3.3 The CHECK Command. The CHECK command is used to syntax check the TRS control statements on the current file (\*SRC). Error messages are printed following any line(s) in error. The control cards are normally listed at the terminal. See the LOFF (paragraph 6.2.3.4) and LON (paragraph 6.2.3.5) commands for how the user can control the listing.

```
#CHECK
                TRS RELEASE mm/yy
      (OPTIONAL LIST OF CARDS)
NO ERRORS DETECTED ON CONTROL CARDS
#
```

6.2.3.4 The LOFF Command. The LOFF command is used to specify that the control cards are not to be listed when the CHECK, RUN, RUNT, or RUNB commands are entered, and remains in effect until a LON command is received. An OPTION statement is generated if this command is in effect when RUNB is used (see paragraph 4.2.2.5).

```
#LOFF
#
```

6.2.3.5 The LON Command. The LON command resets the effect of the LOFF command and subsequent entries to the CHECK, RUN, RUNT, or RUNB commands will cause the control cards to be listed as they are being syntax checked. This is the default setting and remains in effect until a LOFF command is received.

```
#LON
#
```

PARAM?	★
PHASE I?(YES or NO)	★
HEADER RECORD ON DETAIL FILE?(YES or NO)	★
SELECTION CRITERIA ON DETAIL FILE	
DTL	★
MASTER FILE?(YES or NO)	★
SELECTION CRITERIA FOR MASTER FILE	
MST	★
MATCH CRITERIA FOR DETAIL FILE	
MATCHD	★
MATCH CRITERIA FOR MASTER FILE	
MATCHM	★
ISP CONTROL CARDS	
ISP	★
HOLDA LOGIC STATEMENT	
HOLDA	★
HOLDB LOGIC STATEMENT	
HOLDB	★
HOLDC LOGIC STATEMENT	
HOLDC	★
IF STATEMENT	
IF	★
CNTRS STATEMENT	
CNTRS	★
COMPUT STATEMENT	
COMPUT	★
WRIT STATEMENT	
WRIT	★
RCD STATEMENT	
RCD	★
 PHASE II?(YES or NO)	★
SORT STATEMENT	
SORT	★
SIZES STATEMENT	
SIZES	★
SELECT STATEMENT	
SELECT	★
HEADER RECORD ON INPUT FILE(YES or NO)	★
LINES STATEMENT	
LINES	★
CLASSIFICATION STATEMENT	
CLASS	★
FOOT STATEMENT	
FOOT	★

Figure 6-01. ASSIST Command Hierarchy of Questions.

HEADING STATEMENTS, INCLUDE "(PA)" IF DATA SUBJ TO PRIV ACT	
HEAD	*
HOLDA LOGIC STATEMENT	
HOLDA	*
HOLDB LOGIC STATEMENT	
HOLDB	*
HOLDC LOGIC STATEMENT	
HOLDC	*
CONTROL BREAKS	
CTL	*
IF STATEMENT	
IF	*
CNTRS STATEMENT	
CNTRS	*
COMPUT STATEMENT	
COMPUT	*
TABLE LOOKUP	
TABL	*
PRINT STATEMENTS	
PRT	*

NOTE: The PARAM card is explained in paragraph 4.2.2.5 and is not repeated here.

Figure 6-01. ASSIST Command Hierarchy of Questions. (cont'd)

6.2.3.6 The WOFF Command. The WOFF command is used to set an indicator for Phase I that all WRIT statements (figure 4-10) are to be evaluated for each detail input record. This is the default and remains in effect unless a WON command is received.

```
#WOFF
#
```

- \* 6.2.3.7 The WON Command. The WON command is used to set an indicator for Phase I that only one WRIT statement is to be allowed to be true for each detail input record; thereby preventing more than one record being created per detail record. An OPTION statement is generated if this command is in effect when RUNB/RUND is used (see paragraph 4.2.2.5).

```
#WON
#
```

- \* 6.2.3.7.1 The VON Command. The VON command is used to set an indicator for Phase III that variable data from file code I3, HDREC, HOLD and TABL areas are allowed in headings when final total(s) are printed. This is the default and remains in effect unless a VOFF command is received.

```
#VON
#
```

- \* 6.2.3.7.2 The VOFF Command. The VOFF command is used to set an indicator for Phase III that variable data from file code I3, HDREC, HOLD and TABL areas are not allowed in headings when final total(s) are printed. Blanks are substituted wherever these type fields are referenced. An OPTION statement is generated if this command is in effect when RUNB/RUND is used (see paragraph 4.2.2.5).

```
#VOFF
#
```

- \* 6.2.3.8 The RUN Command. The RUN command will spawn a batch job from a file (RUN filedscr); or will cause syntax checking of the current file (\*SRC) and prompting for file names by file code (see paragraph 6.2.3.11). The retrieval is executed entirely within TSS. Each phase is called as needed and displays its start/stop times and record counts. If the RUN command is used to spawn a batch job from an existing file, the current file is not changed and the snumb is added to the table. If the RUN command is used to run a retrieval in TRS, control returns to the # level if the "BREAK" key is depressed during execution of any phase, after unsaved temporary files are released from the APT.

#RUN (syntax checking) NO ERRORS DETECTED FILE DEFINITION FOLLOWS	(or)	#RUN filedescr SNUMB # nnnnT #
--	------	--------------------------------------

**6.2.3.9 The RUNT Command.** The RUNT command functions the same as the RUN command without the filedescr option, with the exception that the user enters a record count. This count is passed to the first phase which executes and causes termination of input in that phase when the count is reached. This corresponds to the "Unnnn" option in the DTL and/or SELECT control cards (figures 4-02 and 4-14 respectively). If the "Unnnn" option is coded in the control card(s), it will override the RUNT value from the terminal.

#RUNT;count ENTER RECORD LIMIT - (if not entered above) (syntax checking) NO ERRORS DETECTED FILE DEFINITION FOLLOWS
--

**6.2.3.10 The RUNB Command.** The RUNB command is used to spawn a batch SIS job using the contents of \*SRC as the control cards. If no syntax errors are found, the user is prompted for file names by file code (paragraph 6.2.3.11) and JCL is constructed. An IDENT card image, cc 16-72, must be entered. The job may be directed to a remote printer by responding to the question "REMOTE DEVICE CODE?" with the two-character identifier of the printer; a carriage return causes the job to print online. The batch JCL and control cards may optionally be saved to a PRMFL by answering the question "PRMFL NAME?" with any valid TSS filedescr, not exceeding 47 characters of input. The control cards on \*SRC must not contain the colon (:) character when RUNB is used.

If the LOFF, WON and/or VOFF commands are in effect, an OPTION statement is generated to pass to SIS. If HSZE has been used for a value other than 20, the HSZnnn keyword is added to the OPTION statement. If TRS determines that additional core may be needed for SIS, the COREnn keyword is also added. If the DUMP option is to be added, the command may be entered "RUND" instead of "RUNB". The user may specify option keywords, listed in paragraph 4.2.2.5.1, which will override the generated statement (i.e., if any options are entered by the user in response to the "OPTIONS KEYWDS -" request, all options to be used by SIS must be entered manually).

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#RUNB (or RUND) (or RUNBN/RUNDN) (or RUNBS/RUNDS)  
(syntax checking)  
IDENT ? (enter cc 16-72 of IDENT card, a question mark, or  
a carriage return, see below)  
REMOTE DEVICE CODE? (carriage return or two-character code)  
\* CHECK AVAILABILITY OF PRMFLS? (YES,NO) -  
(file definition, see paragraph 6.2.3.11)  
OPTION KEYWDS - (carriage return or keywords)  
SNUMB # nnnnT (If RUNBN/RUNDN was not used, see below)  
PRMFL NAME? (filedescr or carriage return)  
(status messages if RUNBS/RUNDS was used, see below)

A question mark in response to the IDENT question will display the previous image, if any, and re-issue the IDENT question. A carriage return response will cause the previous image to be used. The previous image may have been entered following a RUNB/RUND command or a TRANSFER verb in the LOOK command. If no previous image has been entered, the request is repeated.

\* If RUNBS/RUNDS is entered, the DJST subsystem is automatically entered to display status of the job. Control returns to the # level when the job terminates. If the COMMAND UNKNOWN message is received, the DJST subsystem has been disabled by site option patches released with system release 6.4.2.

If the user does not have permission to use the RUN command of the CARDIN subsystem, the message "NO CARDIN PERMISSION - USE RUNBN" will be displayed and control returned to the # level. The user should then enter RUNBN or RUNDN and save the JCL/control card file by answering the PRMFL NAME? question. This file can then be converted to BCD using the ASCBCD subsystem and punched with CONVER. It may then be submitted as a batch job with a few modifications unless the select file, explained below, is in BCD format. Otherwise, change the generated \$ SELECTA control card to the site's standard \$ SELECT file for SIS or replace it with a \$ PROGRAM card and the four SIS \$ PRMFL cards described on page 4-1.

If the user is on a VIP terminal and the SNUMB message is cleared from the screen to quickly to be noted, the command SNUMB may be entered at the # level, and will display the SNUMBs of the last ten jobs spawned from within TRS, the first one displayed is the most recent.

If the site has various versions of the SIS batch programs, the user may enter the entire catalog/file string of a SELECT file following any form of the RUNB/RUND command, as follows:

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(The contents of the SELECT file must be as shown in AFM 171-714, Vol I, paragraph 6.3.2.1.)

RUNB;filedescr (The ; indicates the file is in ASCII)  
RUNDS-filedescr (The - indicates the file is in BCD)

6.2.3.11 File Definition Procedures. When a RUN, RUNT, RUNB, (RUND/RUNBN/RUNDN/RUNBS/RUNDS) command is received, TRS determines which input/output files are required or optional based on the control cards present. Refer to figure 3-02, file code chart, for a list of required and optional files. After a successful syntax check, the message "FILE DEFINITION FOLLOWS" is issued. File codes are then displayed followed by a dash, to which a response is entered in one of the formats shown below. For any form of RUNB/RUND, only P, T, 9 or 7 are valid. \* Also unique to RUNB/RUND is the "CHECK AVAILABILITY OF PRMFLS?" message issued just before actual file definition begins. If this question is answered NO, JCL is constructed for PRMFLS without checking to see if they exist. If answered YES, each PRMFL defined is accessed before JCL is constructed. If the access of the file is successful, it is deaccessed and JCL is constructed and the next file code is displayed. If the access is unsuccessful, the question "DO YOU WANT JCL CONSTRUCTED ASIS? (YES,NO,RETRY,ACCESS) -" is issued after the file access error message. At this point the user enters YES if the file will be present when the batch job is run; i.e., another activity will create it. Enter NO to return to the file code display so the file media may be changed; e.g., to a temporary file. Enter RETRY to return to the "ENTER CAT/FILE STRING" message; e.g., to correct a typing error. Enter ACCESS to enter that subsystem to create the file, after which the "DO YOU WANT JCL CONSTRUCTED ASIS? (YES,NO,RETRY,ACCESS) -" message is repeated. The user would normally enter RETRY at this point so the file may now be accessed successfully. (The first letter of each option is all that has to be entered.) When using the "Oxx" or "OxxS" formats with RUN/RUNT, the following precaution must be observed. If the file code being defined is already in the AFT (i.e., saved from a previous execution), it will be used regardless of the value of "xx" unless a REMOVE command is used. For example, if the AFT contains file codes I1 and I2 and the file definition entry is "I1-OI2", the previous I1 will be used. To prevent this,

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do not mark Il for being saved in the earlier retrieval or use the REMOVE subsystem (e.g., REMOVE Il) before entering RUN or RUNT.

RESPONSEMEANING/ACTION TAKEN

\* P (PRMFL). Initiates procedure to access a PRMFL for the file code, if RUN or RUNT. The message "ENTER CAT/FILE STRING-" will be issued. The user may respond with any valid format of a file description supported by TSS. Do NOT enter passwords unless RUNB/RUND was used. The RUN/RUNT commands will prompt the user for any required password(s). The file will normally be accessed with READ/WRITE (R/W) permissions. The filedescr may be followed by ",R" to specify READ permission or ",W" to specify WRITE permission. A short form is available to prevent the extra typeout/in as follows: P;filedescr. For example, to allocate a file MYCAT/MYFILE with READ permission, enter: P;MYCAT/MYFILE,R

\* T (Temporary). TRS will create a temporary file for use during the retrieval. This file will be released upon completion of the retrieval. (See note below regarding disk space assignment for these files.) With RUNB/RUND, no space allocation may be specified.

S (Temporary and Save). TRS will create a temporary file for use during the retrieval. This file will remain in the AFT after the current retrieval is completed. It may, therefore, be used as input to a subsequent TRS retrieval within the same call to TRS.

\* NOTE: If T or S is specified and RUN/RUNT was entered, the following message will be displayed: "INITIAL # LINKS -". Respond with the number of links (twelve 320 word blocks = 1 link) to initially assign to the file. The default is 10 links and may be specified by entering only a carriage return. The maximum value that is acceptable is 999. A short form is available to prevent the extra typeout/in as follows: T;5 would allocate five links. To use the default of 10 links, enter only T or S and the semicolon (e.g., S; ).

- \* 9 or 7 (TAPE9 or TAPE7, RUNB/RUND only). Defines a nine or seven track tape. The LUD, serial number, and file identifier must be entered. The LUD must be three characters and the serial number must be five characters. Each element is separated by a comma. The message "ENTER LUD,REEL#,FILE-ID -" is displayed unless the form "9;lud,serno,filename" is used.
- Oxx (Old Saved Temporary). File code "xx" is a temporary file that was previously saved with an "S" response or created by another TSS subsystem with a two-character file name. TRS will now use file code "xx" and change it to the file being defined. File "xx" will no longer be available. The file code being defined will be removed from the AFT upon completion of the retrieval.
- OxxS (Old Saved Temporary-Save Again). This is the same as Oxx above, except the new file is left in the AFT upon completion of the retrieval.

As an example of file definition for the following control cards is shown below:

\* #RUN  
TRS RELEASE mm/yy  
SORT 3,1,A  
SIZES ,3  
PRT01 CC01, 1/18  
NO ERRORS DETECTED  
  
FILE DEFINITION FOLLOWS  
WS-P;filedescr  
WT- (carriage return indicates no more sort inputs)  
I3-S;8  
SORT WORK FILE COMPUTED AT xxx LINKS  
ENTER OVERRIDE # LINKS OR CR -

File WS will be a PRMFL and I3 will be a saved temporary file containing the sorted output of Phase II and will initially contain 8 links. A subsequent retrieval, with the following control cards to print the same file in a different format might be:

```
#RUN
HEAD  CCT2,"THIS IS AN EXAMPLE"
PRT01  CC01,1/6,4S,7/6,4S,13/6
NO ERRORS DETECTED

FILE DEFINITION FOLLOWS
I3-OI3S
```

The previously sorted file (I3) that was saved by the first retrieval will be used as input to the current retrieval. The current retrieval requires only Phase III, the input to which is file code "I3". The "OI3S" signifies that file code "I3", which is already in the AFT, is to be used as file code "I3" again and saved in the AFT upon termination of this retrieval. This method can be used to format many different reports from the same sorted data and only executing the sort phase once.

An algorithm is used to approximate the number of links required for a sort work file (SR) when RUN or RUNT is used. If the user desires to change this allocation, a value representing the number of links may be entered. To use the calculated value, enter a carriage return.

- \* NOTE: When a SORT or MERGE control card is present, the file definition routine will continue to ask for file codes WS through WZ until only a carriage return is received. If Phase I specifies file codes "WS" and "WV" in RCD cards for example, these file codes would be asked for and resolved prior to "WT" since it is known that "WS" and "WV" are required files for this retrieval.

#### 6.2.3.12 The LOOK Command.

a. The LOOK command is entered automatically when a RUN or RUNT command is received and the retrieval executed Phase III. When this is the case, the message "LOOK CMD READY" will be displayed followed by a question mark (?) on the next line indicating LOOK is ready for a verb to be entered (paragraph c below).

```
PHASE III STARTING
xx RECORDS INPUT
xx RECORDS SELECTED
nn PAGES IN REPORT
LOOK CMD READY
?
```

b. The LOOK command may be entered explicitly at the # level if the user has previously used the KEEP verb (paragraph c below) and wishes to reaccess the PRMFL created. The PRMFL could also have been written by a batch execution of SIS.

```
#LOOK filedescr
ENTER CAT/FILE STRING - filedescr
LOOK CMD READY
?
```

NOTE: The "ENTER CAT/FILE STRING -" line is not displayed if the user enters the filedescr on the line with the LOOK command.

c. LOOK Command Verbs. The following verbs may be used to examine the contents of the print file:

<u>VERB</u>	<u>FUNCTION</u>
<u>LIST</u>	Displays the current print line. Does not change line pointer.
<u>LIST</u> <u>nnnn</u>	Display the next "nnnn" lines, beginning with the current record. Line pointer is left at the last line printed.
<u>LIST</u> <u>ALL</u>	Display all print lines, beginning with the current record until EOF is reached. Line pointer is left at BOF when EOF is reached or break is received.
<u>PRINT</u>	Interchangeable with all forms of LIST.
* <u>SLEW</u> <u>ON</u> <u>SLEW</u> <u>OFF</u>	With the SLEW OFF default setting, all line feeds of greater than five lines are double spaced to save paper/time, but will print as specified if the TRANSFER verb is used. If SLEW ON is entered, all line slews will be as they appear in the print lines. In either case, top-of-page slews are always quadruple spaced.

FORWARD Position file to next print line.

FORWARD nnnn Position file forward "nnnn" lines.

FORWARD P Position file forward to next print line that slews to top-of-page.

FORWARD Pn Position file forward to the nth print line that slews to top-of-page.

SPACE Used interchangeably with all forms of FORWARD.

\* SKIP Used interchangeably with all forms of FORWARD.

BACK Position file to BOF.

BACK nnnn Position file back "nnnn" lines from current line. If "nnnn" is greater than or equal to the current line, the file is positioned at BOF.

LAST Display the last print line on the report. The TSS format "LISTL" may also be used.

\* LINE Display the current line number.

LINE nnnn Position file to line "nnnn".

SEARCH /string/ Beginning with the current record, search the file for occurrences of the string specified between delimiters. The maximum string length is 35 characters. Any character except a space may be used as a delimiter, as long as it does not appear in the string. The file is left positioned on the record containing the string. If the string is not found, the file is left at BOF.

\* SEARCH /string/ Beginning with the current record, search the file  
;nnnn for the "nnnn"th occurrence of the string. File is left positioned on the record containing the string or at BOF if the string is not found.



SEARCH /string/;\* Count the occurrences of the string beginning with the current record to EOF and display the count. File is left at BOF. If the asterisk is followed by the letter "L", each record containing the string is listed. When the "L" is used, only one occurrence per record is counted.

SEARCH With no string specified, the SEARCH verb checks to see if a previous string was entered and looks for the next occurrence of the same string leaving the file positioned on that record or at BOF if the string is not found. When EOF is reached, any previous string is cancelled. The current record is bypassed before resumption of looking for the string to prevent finding it in the same record on a repetitive basis.

FIND Interchangeable with all forms of SEARCH.

NOTE: SEARCH (or FIND) operates on a character-by-character scan across each print record; therefore, it is possible for more than one occurrence of a string to be found in the same record, except in the case where no string is entered above.

VERIFY List the resulting print line following all verbs that change the line pointer. This option remains in effect until a NOVERIFY verb is received.

NOVERIFY Resets the VERIFY option.

NOTE: The FORWARD (SPACE), BACK, LINE or SEARCH (FIND) verbs may be followed by the letter "V" to indicate that the resulting line be listed. The verb may be spelled out (SEARCHV) or abbreviated (SEARV).

SIZE nnn Specify the maximum size of print lines to be displayed at the terminal before folding to the next line occurs. It is used in conjunction with the LIST verb. The value must be a multiple of four and cannot exceed 132. The value is cancelled when the LOOK command is exited by the RELEASE, DONE, KEEP or TRANSFER verb or the BREAK key is used while at the ? level. The default setting is 80 upon entry to the LOOK command.



\* CLEAR This verb is used to clear a VIP screen and position the next ? display at the top of the screen.

\* KEEP This verb is used to save the contents of the print file to a PRMFL. Catalog levels are allowed up to a maximum of 47 input characters in the line.

TRANSFER ONL This verb spawns a batch job to print the report on  
or the ONLine printer or on the remote printer whose  
TRANSFER dd device code is "dd". The user must enter an IDENT card image unless a previous value has been entered here or with any form of RUNB, in which case a carriage return causes the previous value to be used.

\* NOTE: If the user does not have permission to use the RUN command of the CARDIN subsystem, the message "NO CARDIN PERMISSION-USE KEEP" will be issued and control returned to the ? level. The KEEP verb may be used and a batch CONVER job submitted to print it. If the entry to LOOK was automatic, a quick-access PRMFL is created with the name formatted as HH..TTT, where HH is the hour and TTT is the thousandths of hours. The batch print program automatically purges this file upon normal termination. The file name is displayed at the terminal so the user can release the file if the batch print program aborts for any reason. On a VIP terminal, there is a delay of approximately 10 seconds before the SNUMB number is issued to prevent the screen from being cleared before the file name is seen.

The following procedure may be used if the UMC under which the user is running does not have enough space for a quick-access PRMFL but the user does have the proper permissions for another catalog:

```
?KEEP filedescr (save print file under catalog)
#LOOK filedescr (same catalog/file string)
  LOOK CMD READY
?TRANSFER ONL (or to a remote printer)
```

NOTE: This print file will not be purged upon completion of the batch print job since a PRMFL was used to enter LOOK. The user must purge it explicitly.

\* RELEASE (or) The RELEASE or DONE verb specifies that the user is  
DONE (or) finished with the print file. The file "PA" is  
DONEN removed from the AFT unless the form "DONEN" is used.

- \* COMPRESS      These verbs are used to specify the amount of data  
NOCOMPRESS    sent to a terminal. COMP is used to specify that  
multiple blanks be eliminated and NOCO resets the  
COMP option, and is the default setting. The COMP  
verb has no effect on print lines when the TRANSFER  
verb is used; i.e., all blanks will be included.

- \*      An optional multiple verb input (MVI) feature may be used to execute up to ten verbs once or a specified number of times. The syntax of the MVI option is as follows. Immediately after the ? from LOOK, enter a left bracket ([]) followed by the first verb and its operand, if any. Each subsequent verb and operand is separated from the previous one by a backslash character (\) with the exception of the last verb in the line, which is followed by the closing right bracket (]). If the verb list is only to execute once, the line is then transmitted. To specify that the list is to execute to EOF or a specified number of times, follow the right bracket with a colon (:) and either the letters EOF or a numeric value up to 9999. If EOF is entered, the verb list will stop executing when EOF is reached. If a count is entered, the entire verb list will execute that many times. To list one line, skip 10 lines, list one line, etc., until EOF is reached, enter the following:

?[LIST 1\SPACE 10]:EOF

The verb list starts executing with the file positioned as it was before the MVI list was received (i.e., the file is not rewound before the verb list starts executing).

NOTE: The DONE, KEEP, and TRANSFER verbs do not return to the LOOK command processor upon completion; therefore, if these verbs are used in an MVI line, they should be last since there will be no return to the verb list.

6.2.3.13 The DONE Command. The DONE (or SYSTEM) command is used to exit TRS. The status of the AFT may be determined by referencing paragraph 6.2.3.16.

- \* 6.2.3.14 The CLEAR Command. The CLEAR command clears a VIP screen and positions the next # display at the top of the screen.
- \* 6.2.3.15 TSS Subsystems Valid Within TRS. The following is a list of the standard TSS subsystems that may be entered from within TRS. The Honeywell TSS General Information Manual contains detailed descriptions of each subsystem.

<u>COMMAND</u>	<u>FUNCTION</u>
OLD	Obtain a previously defined file as *SRC.

NEW Initialize a new \*SRC file.

CARDIN If only CARD is entered, TRS passes the current file to CARDIN. OLD or NEW may also be specified.

EDITOR If only EDIT is entered, TRS passes the current file to EDITOR. OLD or NEW may also be specified.

SAVE The contents of \*SRC are written to a specified file. Contents of \*SRC are not changed.

RESAVE The contents of \*SRC are written to an existing file. Contents of \*SRC are not changed.

LIST List the contents of file specified or current file.

SCAN Scan contents of file(s) listed in string.

JABT Abort a batch job initiated from this terminal.

JOUT Retrieve data from a batch job.

JSTS Display status of a batch job and return to TRS.

DJST Display status of a batch job and return to TRS when job terminates.

HELP Display explanation of TSS error message(s).

FDUMP Manipulate a file.

STATF Display names currently in AFT.

ACCESS Create, modify or release files and/or catalogs.

ASCB CD Convert a file from ASCII to BCD.

BCDASC Convert a file from BCD to ASCII.

LENGTH Display a file's attributes.

REMOVE Remove entries from AFT. Purge temporary files.

RELEASE Purge files from User's Master Catalog.

GET Place an entry for a PRMFL in the AFT.

CATALOG List all catalogs/files in the User's Master Catalog.

PERM Create a PRMFL from a temporary file.

SYSTEM Return to the SYSTEM? level unless followed by the name of another subsystem and, optionally, its parameters. In this case, control is passed directly to the new subsystem.

BYE Initiate TSS logoff procedures for the terminal.

The CALL command may be used to invoke user written subsystems or other standard TSS subsystems that are not included in the TRS command list. It is entered as follows:

#CALL ssname [parameters]

ssname Is the name of the subsystem to be invoked and must be entered after leaving one space after "CALL".

parameters Specifies any parameters to be passed to the invoked subsystem. (i.e., after the "CALL" and one space, enter the rest of the line as if at the SYSTEM? level.)

- \* Upon return to TRS, if a job was spawned the SNUMB is added to the snumb table, the message "<CALL COMPLETED>" is issued, and control returns to the # level.

NOTE: The contents of the current file (\*SRC) and/or the AFT may be modified by the invoked subsystem; therefore, this command must be used carefully.

COMMAND	RESULTING ACTION AND/OR LEVEL
Other TSS Subsystems	Returns to TRS # level after subsystem's normal break processing is completed.

6.2.4 Sample Inputs. The TRS inputs are used identically to SIS. These are defined in paragraph 4.2.4 and are not repeated in this section.

6.2.5 Keypunch Instructions. The responsibility for keypunch and verification will be determined by each user and DPI in accordance with local procedures.

6.3 Output Requirements. The purpose, time, mode, medium and location of any output is at the discretion of each user, depending on the requirements and local application of TRS. AFM 171-100 should be referenced to insure compliance with standards.

6.3.1 Output Formats. The format of any and all output information is entirely at the discretion of the user, qualified only by the standards in AFM 171-100.

6.3.2 Sample Outputs. Reference paragraph 4.2.4, Sample Inputs, which contains coding examples of the input cards and the resultant output formats.

6.3.3 Output Vocabulary. Legal character combinations or codes to identify or compose output items are dependent on each user's choice of files or data bases to be utilized in conjunction with TRS.

6.4 Utilization of System Outputs. The utilization of all outputs are at the discretion of each user, dependent on the requirements and application of TRS.

6.5 Recovery and Error Correction Procedures. Recovery and loading procedures for TRS are contained in AFM 171-714, Volume I.

6.5.1 Nonfatal Error Messages. The following error messages may be displayed at the terminal and processing can continue.

<u>MESSAGE</u>	<u>EXPLANATION</u>
COMMAND UNKNOWN	A command other than those listed in paragraphs 6.2.3.2 through 6.2.3.15 was received.
ILLEGAL ASCII CHARACTER IN CONTROL CARD	TRS control cards may contain all ASCII characters except the following: at sign, underscore, tilde, vertical line, and left and right braces; octal values 100, 137, 176, 174, 173 and 175 respectively. Correct and re-run the retrieval.

THIS CONTROL CARD IS REQUIRED	ASSIST has received only a carriage return in response to a control statement that must be used (e.g., RCD card in Phase I).
COLUMN 78 EXCEEDED	ASSIST received too many input characters in the last line. The control information is repeated.
*SRC IS NULL	A CHECK, RUN, RUNT, or any form of RUNB was entered but no data exists on *SRC.
ONLY P, T, 9 OR 7 ARE VALID	During file allocation for any form of RUNB, the user responded with other than P (PRMFL), T (Temporary), 9 (TAPE9), or 7 (TAPE7) for the file to be allocated or created.
CAT/FILE TOO LONG	In any form of RUNB, the maximum length of a catalog/file string for a PRMFL is 48. This includes the user identification even if it was not entered from the terminal if the first character is a slash or a quick access file is being defined. The "ENTER CAT/FILE STRING" message is repeated.
FILE NAME > 47 CHARACTERS	The "PRMFL NAME?" response must not exceed 47 characters. Catalog levels are allowed up to that limit.
SPECIFIED FILE CODE WAS NOT SAVED	During file allocation in RUN or RUNT, a file code was specified as "OLD" but the previous file code was not in the AFT. Possibly the user has issued a REMOVE command or TRS has been exited (to the SYSTEM level) since the file was marked for saving.
FILE PA IS NULL	No data exists on the print file used as input to the LOOK command.
FILE NOT CREATED BY SIS OR TRS	The LOOK command was entered explicitly but the file accessed is not in print format (i.e., media code 3 and report code 21). Control returns to the # level.
VERB UNKNOWN	An unknown verb was entered to the LOOK command
SIZE VALUE ILLEGAL	The value following the SIZE verb is not numeric, a multiple of four or is greater than 132.
* SNUMB INVALID	A snumb entered to SNUP or SNZE was not five characters in length or did not start immediately after the command.

INPUT TOO LONG	The number of characters received was too large for the LOOK command to process.
NOTHING AFTER VERB	A verb was entered to the LOOK command which requires additional data, such as SEARCH when no previous string has been entered or EOF was reached.
MAXIMUM OF 4 DIGITS	The count field of a verb in LOOK exceeds four digits in length.
COUNT FIELD NOT NUMERIC	Self-explanatory.
* NOTHING AFTER DELIMITER	A carriage return was found immediately following the string delimiting character; or, RUNB was followed by a ; or - but no filedscr.
ILLEGAL CHAR AFTER DELIMITER	A semicolon or carriage return must immediately follow the second delimiter. Possibly the delimiter chosen was used in the string (e.g., SEARCH /03/77/ ). If the line was an MVI input line, no colon or carriage return was found after the closing bracket.
NO DATA FOLLOWS ;	A semicolon followed the second delimiter but a carriage return was the next character.
NO CLOSING ]	An MVI line is in error.
MAX 10 VERBS	An MVI line has too many verbs.
* MUST BE "ONL" OR 2 CHAR DEVICE ID	The TRANSFER verb operand was in error.
TEMP FILE NOT AVAILABLE	The TRANSFER verb could not create a one-link file to spawn the batch job. Control is returned to the # level but file PA is not released. The user should release some disk space and enter the LOOK command as follows: LOOK #PA# (include the pound signs as shown). Retry the TRANSFER verb.
NOTHING BETWEEN DELIMITERS	Two consecutive delimiters were found.
* UNRECOGNIZABLE OPTION AFTER RUNB	The RUNB/RUND command is invalid as entered.

- \* INVALID ACCESS  
TO PERM FILE -  
nnnn
- During file definition in RUN/RUNT, or RUNB/RUND if requested by the user, a PRMFL could not be accessed. The "nnnn" is replaced by an error code and a second line is usually displayed giving the text of the error message; e.g., for code "4025" the message "(REQUESTED ENTRY NOT ON-LINE)" would be displayed indicating that the file is on a removable pack which is not currently mounted. If no second line is displayed, the error code may be found in Honeywell manual DD17 under the DRL FILACT description. If RUN/RUNT was entered, the "ENTER CAT/FILE STRING -" request is repeated up to a maximum of four times before returning to the # level. If RUNB/RUND was entered, reference paragraph 6.2.3.11 for options.
- NO CARDIN  
PERMISSION
- The user does not have permission to use the RUN command of the CARDIN subsystem; therefore, no batch job can be spawned. See the command or verb in question.
- FILE SPACE  
EXHAUSTED-ff
- If the file code specified (ff) is a PRMFL, increase maximum size and rerun. If it was a temporary file (T or S reply in file allocation), rerun specifying a larger number of initial links for the file.
- FILE SPACE NOT  
AVAILABLE
- During file allocation in RUN or RUNT, the number of links requested or defaulted for a temporary file could not be obtained. The "INITIAL # LINKS" message is repeated.
- NO ROOM IN AFT
- During file allocation in RUN or RUNT, the AFT has become full. Control is returned to the # level so some file(s) may be removed, then enter the RUN or RUNT command again.
- FILE PA-STATUS n
- Phase III print file cannot be created. The "n" is 3 for no space in AFT; 4 for no disk space; 6 for no PAT space; or 7 for illegal device specification.



NO DISK SPACE  
FOR SORT WORK  
FILE

Phase II is requested but there is not enough contiguous disk space available at the present time to allocate the collation file. This file space is an accumulation of links requested if files WS-WZ are temporary or 20 links for each PRMFL to be read by the sort. Try the RUN or RUNT command later.

NO ROOM IN AFT  
FOR SORT WORK  
FILE

Phase II is requested but the AFT is full and the sort work file cannot be created. Control is returned to the # level so some file(s) may be removed, then enter the RUN or RUNT command again.

MEDIA CODE x  
INVALID FOR fc

Only files with media codes 0, 2, 3, 4, and 7 may be read by TRS. (Reference Honeywell manual DD07, File and Record Control.)

6.5.2 Fatal Error Messages. The following error messages indicate fatal errors have occurred and TRS processing cannot continue:

MESSAGE

EXPLANATION

I/O ERR READING  
\*SRC

The current file (\*SRC) could not be read to copy control card images to the RUNB job file. Attempt to rerun the retrieval.

I/O ERR READING  
PA

The print file could not be read by the LOOK command verb. Rerun the retrieval.

\* FAULT VECTOR  
HIT

These messages are followed by "RE-RUN AND IF STILL ABORTS REF. PARA. 6.5.2 OF AFM 171-714, VOL II." If a retrieval has aborted for the second time, follow this procedure to spawn a job to print the core dump.

or  
I/O ERROR ABORT

or  
ABORTING -  
RECORD COUNTS  
FOLLOW

SYSTEM? SABT

OFFSET? W

IDENT? (enter cc 16-72 of IDENT card)

6.5.3 Syntax Error Messages. The TRS syntax error messages correspond exactly to the SIS messages which are listed in paragraph 4.5.1 and are not repeated in this section.

18 April 1980

BY ORDER OF THE SECRETARY OF THE AIR FORCE

OFFICIAL

DAVID C. JONES, General, USAF  
Chief of StaffJAMES J. SHEPARD, Colonel, USAF  
Director of Administration

## SUMMARY OF REVISED, DELETED, OR ADDED MATERIAL

1. This volume has been rewritten into parts and sections, eliminating Attachment 1 as the documentation for TRS. Attachment 1 is now a subject index which may be used to locate specific topics in the documentation.
2. Scientific collating sequence is now the default on MATCHD/MATCHM control cards.
3. A decision logic table (table 4-02) has been added to assist the user in choosing the proper control cards and file codes.
4. A more comprehensive explanation of logic statements is provided in paragraph 4.2.4.2.
5. Several new commands have been added to TRS. Reference paragraphs 6.2.3.2 through 6.2.3.15.
6. An option has been added to the CNTRS control card for Phase I. This option allows specified counters to be incremented by one for each input record instead of being reset to zero as each input record is read. Reference figure 4-08.
7. An option has been added to the HDREC control card for Phase III which allows the user to specify that the record be written to file FA if RCD control cards are present. Reference figure 4-15.

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DEPARTMENT OF THE AIR FORCE  
Headquarters US Air Force  
Washington DC 20330

CHANGE 4  
AFM 171-714  
Volume II  
20 April 1979

Automatic Data Processing Systems and Procedures

SELECTIVE INQUIRY SYSTEM (SIS): P037/QI

AFM 171-714, Volume II, 7 March 1978, is changed as follows:

1. Page Insert Changes:

Remove	Date	Insert
4-1, 4-2	7 Mar 78	
4-3, 4-4	23 Jan 79	4-1 thru 4-4.1
4-41, 4-42	7 Mar 78	4-41 thru 4-42.1
4-59, 4-60	22 Nov 78	4-59, 4-60
4-63, 4-64	22 Nov 78	
4-65, 4-66	5 Jul 78	
4-67, 4-68	7 Mar 78	4-63 thru 4-68
6-9, 6-10	23 Jan 79	
6-11, 6-12	5 Jul 78	6-9 thru 6-12

2. Write-In Changes:

Page	Reference	Line	Action
ii	4.2.2.5.2 PARAM Card		Add "4.2.2.5.3 CONCAT Card" and page number 4-4.1
4-51	NOTE:	4	Change "of" to "or."
4-54	ALLOWABLE PREFIX REFERENCES	1	Add "NOTE: Do not use "H" if final totals slew to top-of-page before printing."
4-55	C(s,l)	11	Change "that" to "than."
		19	Insert "use" after "nor."

No. of Printed Pages: 22  
DISTRIBUTION: F

**1 SELF-COVER**

20 April 1979

Page	Reference	Line	Action
6-4	SNUMB	3	Add "The command SALL may be used to enter DJST for all snumbs in the table."

BY ORDER OF THE SECRETARY OF THE AIR FORCE

OFFICIAL

LEW ALLEN, JR., General, USAF  
Chief of StaffVAN L. CRAWFORD, JR., Colonel, USAF  
Director of Administration

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DEPARTMENT OF THE AIR FORCE  
Headquarters US Air Force  
Washington DC 20330

CHANGE 5  
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22 June 1979

Automatic Data Processing Systems and Procedures

SELECTIVE INQUIRY SYSTEM (SIS): S037/QI

AFM 171-714, Volume II, 7 March 1978, is changed as follows:

1. Page Insert Changes:

Remove	Date	Insert
3-5 thru 3-8	7 Mar 78	3-5 thru 3-8
4-3 thru 4-4.1	20 Apr 79	4-3 thru 4-4.1
4-17, 4-18	23 Jan 79	
4-19, 4-20	7 Mar 78	4-17 thru 4-20
4-45, 4-46	22 Nov 78	4-45, 4-46
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4-55, 4-56	5 Jul 78	4-53 thru 4-56
4-61, 4-62	22 Nov 78	4-61, 4-62
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6-9, 6-10	20 Apr 79	6-7 thru 6-10.1
6-19, 6-20	22 Nov 78	6-19, 6-20

2. Write-In Changes:

Page	Reference	Line	Action
i	Title line		Change "P037" to "S037."
	USERS MANUAL	1	Add "THIS SYSTEM IS NOT CERTIFIED TO PROCESS SENSITIVE DATA." centered below reference.
1-1	Paragraph 1.1	2	Change "P037" to "S037."
	Paragraph 1.2.g	2	Change "P037" to "S037."

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Page	Reference	Line	Action
4-11	CONTROL CARDS	3	Change "SOFT" to "SORT."
4-32.1	Paragraph beginning with "Where an option..."	9	Change "samller" to "smaller."
4-51	NOTE:	2	Change "54,56" to "53,56."
4-65	First paragraph	3	Add "JY, JD, JT, JH, JM," after "J,."
6-23	NOTHING AFTER	3	Change "of" to "or."
A1-1	Calculations		Change "(4-43)" to "(4-43, 4-62)."

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Headquarters US Air Force  
Washington DC 20330

CHANGE 6  
AFM 171-714  
Volume II  
19 October 1979

Automatic Data Processing Systems and Procedures

SELECTIVE INQUIRY SYSTEM (SIS): S037/QI

AFM 171-714, Volume II, 7 March 1978, is changed as follows:

1. Page Insert Changes:

Remove	Date	Insert
1-1, 1-2	22 Nov 78	1-1, 1-2
3-1, 3-2	7 Mar 78	3-1, 3-2
3-7, 3-8	22 Jun 79	3-7, 3-8
4-1, 4-2	20 Apr 79	
4-3, 4-4	22 Jun 79	4-1 thru 4-4
4-5, 4-6	22 Nov 78	4-5, 4-6
4-27, 4-28	23 Jan 79	4-27 thru 4-28.1
4-35, 4-36	7 Mar 78	4-35, 4-36
4-47 thru 4-50	23 Jan 79	4-47 thru 4-50
6-3, 6-4	22 Jun 79	6-3, 6-4
6-21, 6-22	22 Nov 78	6-21, 6-22

2. Write-In Changes:

Page	Reference	Line	Action
ii	4.2.2.5.2 PARAM Card		Change "4-3" to "4-4."
iii	4.5.2 User Abort Codes		Change "4-27" to "4-28."
v	4-13 SIZES Control Card		Change "4-48" to "4-48.1."
	4-02 Determining Control Cards and File Codes		Change "4-28" to "4-28.1."
4-14	REPORT FORMAT	5	Change "totals 888" to "TOTALS ***."

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CHANGE 7  
AFM 171-714  
Volume II  
18 January 1980

Automatic Data Processing Systems and Procedures

SELECTIVE INQUIRY SYSTEM (SIS): S037/QI

AFM 171-714, Volume II, 7 March 1978, is changed as follows:

1. Page Insert Changes:

Remove	Date	Insert
4-1 thru 4-4 4-27, 4-28	19 Oct 79 "	4-1 thru 4-4 4-27, 4-28

2. Write-In Changes:

Page	Reference	Line	Action
1-1	Paragraph 1.2.f	1	Change "Voumes" to "Volumes."

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CHANGE 8  
AFM 171-714  
Volume II  
18 April 1980

Automatic Data Processing Systems and Procedures

SELECTIVE INQUIRY SYSTEM (SIS): S037/QI

AFM 171-714, Volume II, 7 March 1978, is changed as follows:

1. Page Insert Changes:

Remove	Date	Insert
3-3, 3-4	7 Mar 78	3-3, 3-4
4-27, 4-28	18 Jan 80	4-27, 4-28
4-49, 4-50	19 Oct 79	4-49, 4-50
5-3, 5-4	7 Mar 78	5-3, 5-4
6-25, 6-26	22 Nov 78	6-25, 6-26

2. Write-In Changes:

Page	Reference	Line	Action
4-2	PHASE II:	4	Add "(Reference figure 4-14)" after "SELECT."
4-52	CARD FORMAT:	2	Change "30" to "42."
		3	Change "24" to "36."

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CHANGE 9  
AFM 171-714  
Volume II  
22 June 1980

Automatic Data Processing Systems and Procedures

SELECTIVE INQUIRY SYSTEM (SIS): S037/QI

USERS MANUAL

AFM 171-714, Volume II, 7 March 1978, is changed as follows:

1. Page Insert Changes:

Remove	Date	Insert
4-51, 4-52	22 Nov 78	4-51, 4-52
6-9 thru 6-10.1	22 Jun 79	6-9 thru 6-10.1
6-13, 6-14	7 Mar 78	6-13, 6-14
6-23, 6-24	22 Nov 78	6-23, 6-24

2. Write-In Changes:

Page	Reference	Line	Action
4-42	SYNTAX:	9	Change "S-Z" to "J-R."
4-48.1	Paragraph beginning with "All sorted/merged records.."	7	Delete sentence "The input records must be fixed length."

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